Products finishing

HOWARD CAMPBELL, Editorial Director
FRED W. VOGEL, Managing Editor

Volume 4 | DECEMBER, 1939 | Number 3

Published monthly by
Gardner Publications, Inc.
431 Main St.
Cincinnati, Ohio

•

DON G. GARDNER
President and
General Manager

•

JOHN M. KRINGS
Advertising Manager

GEORGE E. HAY
431 Main St., Cincinnati
Main 0182

G. M. FILLMORE
JOHN VANDERVOORT
342 Madison Ave.
New York
Murray Hill 6-3899

GEORGE H. MEYERS
Tribune Tower, Chicago
Superior 8329

Member

CCA

Copyrighted

CONTENTS

Costume Jewelry Finishing..... 9
By LOUIS WEISBERG

Cleaning and Painting of Cast Parts Prior to Machining....26
By C. C. HERMANN

Barrel Finishing of Metal Products.....32
By H. LEROY BEAVER

Protective Enamel Finishes for Magnesium Base Alloys.....42
By E. E. HALLS

News of the Industry.....48

Finishes That Aid in Appearance and Utility.....52

The Finishing Forum—

Disposable Paint Mixing Containers.....54
By WILLARD SEEMAN

Simple Holding Devices for Laboratory Glassware.....54
By A. H. WAYCHOFF

Portable Auxiliary Tank.....55
By CHAS. H. WILLEY

New Plant Equipment and Materials.....56

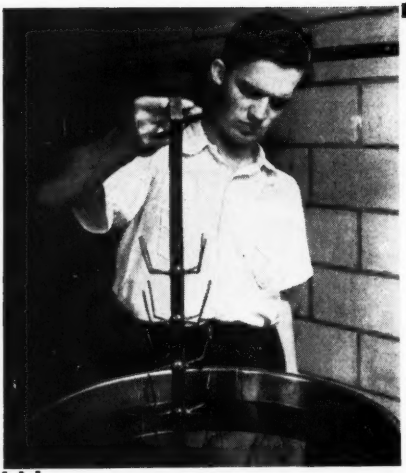
"Did You Know That—".....63

Opportunity Section 77

For Your Catalog Library.....78

Index to Advertisements.....80

More Than 14,750 Circulation This Issue



It's Simple and Inexpensive

TO COAT PLATING RACKS IN YOUR PLANT

Why should you depend on outside sources for protective coatings for your plating racks? By the use of Miccrolite, every necessary operation can be handled in your plant....quickly, effortlessly and at extremely low cost per rack.

Miccrolite is applied directly on the metal surface of the rack. It is only necessary to clean the racks before coating. The expense of tape or other special treatment has been eliminated. Application can either be by hand-dipping or by the use of inexpensive machine-dipping equipment. The only coating operations with Miccrolite are in dipping. It is not baked after application. Almost any employee can handle the work with excellent results—and, in one day, complete the coating of more than 70 racks, ready for use the next day.

Here are savings for you ... in coating expense ... in time ... and in "headaches" caused by shipping routine and shipping delays. Let us acquaint you with full details.

WRITE FOR THE "MICCROLITE" CIRCULAR.

MICCROLITE

Developed and Manufactured by Experienced Platers

MICHIGAN CHROME COMPANY
6342 East Jefferson Avenue • Detroit, Michigan

PRODUCTS finishing

CINCINNATI, OHIO VOL. 4, NO. 3

DECEMBER, 1939

COSTUME JEWELRY FINISHING

By LOUIS WEISBERG

Louis Weisberg, Inc., New York City, N. Y.

A LARGE part of the jewelry manufactured today comes under the classification of costume or novelty jewelry—jewelry of the kind that is prized less for its intrinsic value than for its appearance and style. The amount of precious metal used is generally not an important factor in determining the cost. Precious stones likewise are ruled out on account of cost, but semi-precious stones may be used, especially in the better pieces. The bulk of such merchandise is made with inexpensive stones and finished with the minimum amount of precious metal that can be used to give satisfactory color and wear. In general, this involves "flash" coatings of gold or rhodium, protected on bright finishes with a coat of lacquer.

Of course, there is a certain amount of costume or novelty jewelry in which precious metals and stones are used, but this has only a limited market. The bulk of the business is done on lower priced merchandise. Indeed, a fairly low price is an essential characteristic, without which the market for costume or novelty jewelry could not have grown to the volume it has reached in recent years. The object of the manufacturer is to make this jewelry so it can be sold at a price low enough to permit a woman to buy a piece for every new costume, and discard the ornament when the costume becomes worn out, or as is more often the case, outmoded.

The manufacturer who makes jewelry of high intrinsic value does not have to make a great many pieces in order to obtain a satisfactory dollar volume. In the case of costume and novelty jewelry, however, a considerable production is necessary in order to show a profit.

One of the largest manufacturers of this class of jewelry is Cohn & Rosenberger, Inc., located in Providence, R. I. In this article, the finishing operations in that plant, especially as they relate to electroplating

Fig. 1—A general view of the brass plating department. The main cleaning line is located at the right foreground and the tubbing machines are shown at the left.

and lacquering, are described.

Until about a year ago, the Cohn & Rosenberger plating department was not much different from almost any jewelry plant to be found in and around Providence, where this industry is largely located, except for size and floor space occupied. And in most other shops in Providence, gold plating was carried out in three or four gallon pots. The difference between a large shop and a small one in Providence has hitherto been chiefly in the number of such pots. Larger equipment and straight line production methods were unknown in the industry. When it became known that Cohn & Rosenberger planned such a radical departure from accepted practice, local prophets freely predicted that such methods might be all right for automobiles or hardware, but would never go for jewelry. Nevertheless, last summer Cohn & Rosenberger, Inc., tore out all their old plating equipment, and replaced it with new and modern equipment, which makes it one of the most modern plants of its kind. The results of almost a full year's operation have proved that jewelry can be plated efficiently by production methods just as well as any other kind of merchandise.

In planning the new layout at Cohn & Rosenberger, account had to be taken of the fact that there are thousands of items in the line, all of which are highly susceptible to change in style. The average life of any design is short, at most, only a few months. The line therefore is constantly changing, and in setting up for any operation in the plant, tools must be made flexible enough to take care of a varied assortment of items. While the aggregate production is large, the total production on any single item may vary a great deal. Every new design involves a considerable risk, for every number does not sell well enough to justify the expense of elaborate tooling. Too great an investment in special tools

or racks for any one item would be dangerous, because that particular item might not sell well enough to justify it. Flexibility and adaptability are, therefore, essential requisites of any plan for handling this type of work.

The base metal for the jewelry made at Cohn & Rosenberger is either brass or white metal. Since the manufacturing operations are so different, the two lines have been segregated and a separate plating room is provided for each. A great part of the white metal is finished in rhodium; the remainder in various shades of gold. In the brass department, gold finishes predominate. Besides the bright gold finishes, there are the so-called antique gold and oxidized silver finishes. A small fraction of the brass goods also is finished in rhodium.

All the goods which receive bright finishes, such as rhodium and bright gold, receive an undercoating of bright cobalt-nickel alloy. The process used in this operation is patented.* The purpose of the undercoating is threefold. In the first place, it covers solder marks and any differences due to the assembly of different metals in the piece so as to give a uniform color on which to apply the final finish. Second, since the amount of precious metal applied on this class of jewelry is not sufficient in itself to provide adequate protection against corrosion of the base metal, the cobalt-nickel undercoating provides the necessary protection. Third, the use of the very bright undercoating helps produce a better looking final finish.

In addition to the undercoating, bright finished work receives a final coating of clear lacquer after gold or rhodium plating. Formerly, an air drying lacquer was used, but now the lacquer is baked in a continuous baking oven, which is described in a later part of this article.

Work to be finished in the antique gold does not receive a cobalt-nickel undercoating, because this would make it too shiny. Moreover, if the base metal does tarnish some, it is not detrimental, but rather adds a realistic touch to the general antique effect.

It will be convenient in what fol-

*U. S. Patent No. 2,026,718.

Fig. 2. — Illustration showing the racking department. Work to be bright plated is placed on clamp-type racks and work to be oxidized is strung on strands of wire.

PENNSALT CLEANERS

CUT CLEANING COSTS OF STEEL, BRASS, ZINC, AND ALUMINUM PARTS FOR

LEADING APPLIANCE MANUFACTURER

HOUSEHOLD ELECTRICAL APPLIANCES, from refrigerators and washing machines to percolators and curling irons, are produced by this prominent manufacturer and sold throughout the nation. Parts in all of these products are cleaned before finishing operations with the help of Pennsalt Cleaners.

In building home laundry equipment alone, the metal cleaning problems involve such varied operations as cleaning oil or grease, or both, from hot and cold rolled steel, cast iron, aluminum castings, and zinc die castings . . . prior to such finishing operations as granodizing. The Pennsalt Cleaners used have eliminated several dipping jobs, and have effected appreciable savings in cleaning materials.

Pennsalt Cleaners are also used by this manufacturer to clean steel parts for radio chassis and speaker frames before bright zinc plating; to clean steel and brass parts for percolators, toasters, and similar appliances prior to bright nickel plating; and to prepare the steel of

refrigerator cabinets for enameling. 85% of all the metal parts that require cleaning are processed with the help of the Pennsalt Cleaners . . . a policy adopted only after careful tests had shown the effectiveness of a particular Pennsalt Cleaner for each operation.

One of the Pennsalt Cleaners is Orthosil . . . a product that in the short space of three years brought outstanding economies to heavy-duty metal cleaning operations in virtually every industry. Companion cleaners have been developed for varied and extreme requirements, forming the present group of Pennsalt Cleaners that meet every need with laboratory precision.

They have exceptional dissolving and emulsifying action, tremendous lasting power, and the ability to do a uniformly quicker, more thorough cleaning job, providing excellent surface finish at exceedingly low cleaning cost. These are the advantages that one or more of the Pennsalt Cleaners offer in your own operations. The extent to which they have already earned the confidence of leading manufacturers indicates what you may expect from a test in your own plant. We will gladly furnish full details. Write today to Dept. P. Pennsylvania Salt Manufacturing Company, Widener Building, Philadelphia, Pa. — New York • Chicago • St. Louis • Pittsburgh • Tacoma • Wyandotte.

PENNSALT

CLEANERS FOR INDUSTRY

Other Pennsylvania Salt Chemical Products used in large quantity by industry.

- Anhydrous Ferric Chloride
- Sal Ammoniac
- Mineral Acids
- Caustic Soda
- Carbon Tetrachloride
- Soda Ash
- Kryolith
- Acid-Proof Cements

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals

lows to treat brass goods and white metal separately. In both cases, however, we begin with the articles at the point where they are delivered to the plating department, all necessary polishing and buffing operations on the base metal having been completed.

A general view of the brass plating department is shown in Figure 1. This room is approximately 80 feet by 50 feet. It will be noted that overhead obstructions that interfere with lighting have been reduced to a minimum. Water pipes as well as steam pipes are insulated to prevent drip. Four large fans insure an adequate supply of fresh air and keep the atmosphere in the room from becoming excessively humid. In addition, special ventilating ducts are provided at the soak tank to remove steam and ammonia vapors which rise directly at the tank.

The work coming into the brass plating room for bright plating is racked or wired near the point at which it enters the room. The general style of racks employed may be seen in Figure 2. The racks are insulated (mostly rubber covered). The size is approximately 16 inches wide by 18 inches deep. Work which is to receive antique or oxidized finish is not generally racked, since it would have to be unracked for rubbing off or relieving the high-lights and then reracked again. Accordingly, the work to be oxidized is gener-

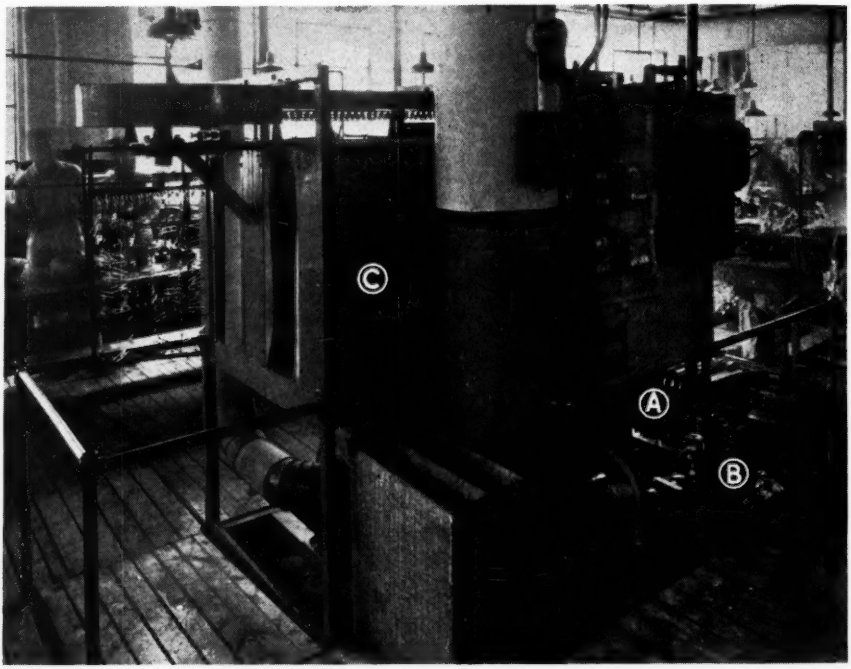


Fig. 3—The plating solution filter is shown at A and the filter pump at B. At C, an electrically heated and controlled dryer can be seen.

You're Missing a GOOD BET If You Haven't Tried . . . VITRA-CARLITE or FRANZITE

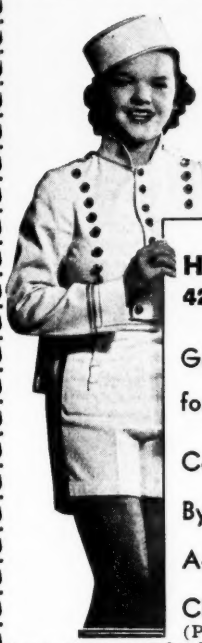
Quick Bake **Quick Air Dry**

● They're two 100% Synthetic, Sales-Appealing Finishes that permit *greater output* with your present equipment.

VITRA-CARLITE bakes hard at 300° F. in 20 minutes—Steps up production where too small oven equipment or longer bake enamels are limiting daily output.

FRANZITE sets in 20 minutes, dries to touch in 45. Specially suitable for those who lack baking facilities, but who want to get their goods out in 24 hours, no longer.

Both Synthetics produce *porcelain-like* finishes with extreme adhesion, hardness, flexibility, mar-resistance, outside durability. Excellent hiding and high resistance to grease, alkali, soap. Comes in colors, Black, White and Clear.



HILO VARNISH CORP.
42-60 Stewart Ave., Brooklyn, N. Y.
BOSTON CHICAGO

HILO

HILO VARNISH CORPORATION
42-60 Stewart Ave., Brooklyn, N. Y.

Gentlemen: We'd like to try a sample of.....

for use on..... We prefer.....(color).

Company.....

By.....

Address.....

City and State.....

(PF—December)

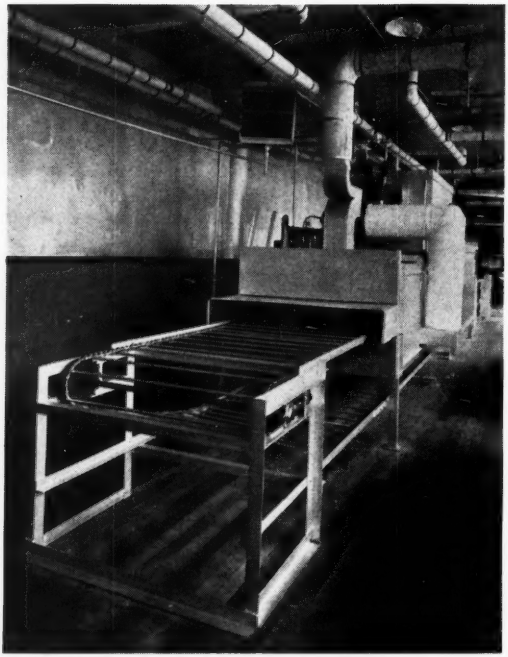


Fig. 4—Trays of lacquered parts are placed on the conveyor of the oven shown herewith.

ally handled on wires rather than on racks. The main cleaning line may be seen in Figure 1. There is an aisle on both sides of the line and the tanks are wide enough so that work can be cleaned simultaneously from both sides, if necessary, without interference.

The first step in the cleaning operations is a soak in a solution containing a special soap and ammonia. In this soaking operation most of the buffing composition is loosened and comes off. The proper functioning of this soak depends not only on the soak itself, but also on the use of polishing and buffing compositions that lend themselves to removal by this operation. An important thing in this connection is not to have too much buffing composition on the work as it comes into the plating department. This is avoided in part by care in polishing and in part by intermediate cleaning or degreasing in the polishing department. All work is degreased after it has been cut down and then colored. When it is realized that until a year ago practically all of this work was brushed by hand as part of the regular cleaning operation, some appreciation of the problem involved may be visualized especially since articles of jewelry often have deep recesses and crevices in which dirt and polishing composition may become lodged.

Following the soaking operation, the work is rinsed in hot water and then cleaned in an electric cleaner. After another water rinse, the work passes through a cyanide dip and after still another water rinse, through an acid dip. After rinsing off the acid, it is ready for plating in the cobalt-nickel solution, which is operated in much the same way as an ordinary warm nickel solution, except that the solution must be agitated and must be filtered constantly to keep it meticulously clean and free from suspended matter. After the cobalt-nickel plating operation, the work is first rinsed in a dragout recovery tank, and then given several rinses in clear running water. The solution in the dragout tank is used to replace water evaporated in the main cobalt-nickel plating tank.

The cobalt-nickel plating tank itself is a rubber lined tank of approximately 400 gallons capacity. The

solution is agitated by means of a motor driven shaft, equipped with propellers, the propellers and shaft being also covered with rubber. Automatic temperature control is provided. The anodes are enclosed in bags made of two thicknesses of cloth to keep loose particles of the anodes from falling into the solution. The filter is a rubber covered Sperry plate and frame type unit with twelve chambers each 12 in. x 12 in., connected to a Duriron pump. Part of the filter may be seen in Figure 3.

After nickel plating, the work is gold or rhodium plated, without reracking it. A separate gold tank is required, of course, for each different color of gold that is to be plated. At the present time, two shades take care of all the bright finished gold, except for a limited amount of work which is finished in three colors. The two principal shades are—one which is generally referred to as Old English and another as Pine Gold. The latter is a paler gold than the Old English and might be described as having approximately the same color as 16 karat yellow gold.

In order to produce uniform gold colors which are reproducible from day to day and month to month, careful control is necessary. First of all, the composition of the solution is checked each day by the chemist. The temperature is automatically controlled. The time of plating and the current used are watched with care. An interval timer together with a volt meter and ammeter are provided to guide the operator. In addition, ampere hour meters are connected in the circuit for each tank, so that the chemist can keep track of the amount of plating done in each tank. Additions to the solution between analyses are made on the basis of ampere hour meter readings.

The gold coating is applied in two stages, the first of which is the so-called shading operation to cover the nickel and the second the final gold color. The two stage operation is preferred because it gives more uniform results than a single plate.

The gold and rhodium plating tanks are steam jacketed steel kettles lined with Pfaudler chemically resistant glass. Each holds 30 gals. of solution.

Fig. 5—Thorough baking is assured in this oven in which the temperature is maintained at 200 degs. F. at the entrance and 375 degs. F. at the exit end.

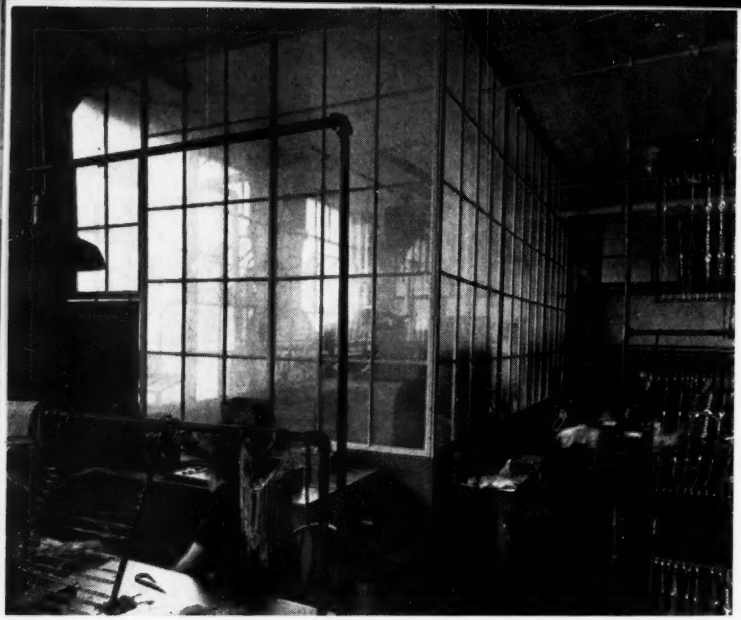


Fig. 6 — A portion of the brass plating department is shown in the foreground. The glass partition encloses the lacquer dipping room in which the air is continuously filtered.

The time of plating in either gold or rhodium is usually somewhere from 10 to 30 seconds, according to the requirements of the particular color being plated. After plating, the work passes through a dragout recovery tank, then through several water rinses, and finally through a pressure spray rinse, after which it enters the dryer. Each gold and rhodium tank has its own dragout tank, the contents of which is added to the appropriate tank to replace evaporated water and save precious metal.

The dryer is a Metalwash cold and hot blast type, electrically heated. The racks are carried through the dryer on a conveyor and returned to the same end. Most of the water is mechanically blown off while the work travels through the cold blast, and the remainder is evaporated as the work travels through the hot blast. A good view of the dryer is shown in Figure 3.

From the dryer, the work is carried to the unracking and inspection benches. Here, every piece is inspected by girls trained to reject any defective pieces. A record of rejects is kept with all rejects classified according to cause for rejection. Incidentally, this record has been very helpful in locating and eliminating the principal causes of defective plating.

After inspection, those parts which are to be lacquered are carried into the lacquer room, where they are sprayed and the lacquer baked in a continuous type gas heated baking oven. Work is fed at one end and taken out at the other. Figure 4 shows a view of the baking oven from the front end and Figure 5 shows a view from the delivery end. The temperature is automatically controlled at 200 degs. F. toward the entrance and at 375 degs. F. towards the exit end.

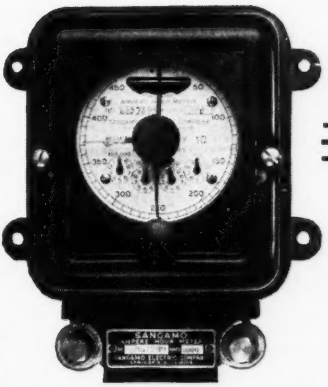
Lacquering is carried out in a separate room which is kept closed except when work has to be brought in or taken out. The room is ventilated by a large blower which delivers filtered air at one end of the room and by fans which discharge air to the outside at the other end.

In addition to transparent lacquer coatings, considerable use is made of enamels for producing two and three color effects. In many cases, it is

New Accuracy

IN

PLATING CONTROL



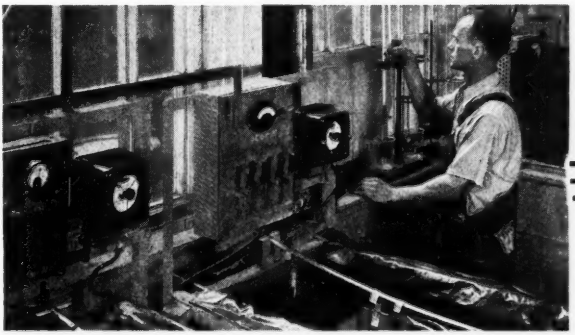
Type IT indicates amperehours used in single operations and totalizes long period plating.

The SANGAMO Amperehour Meter provides an accurate method for controlling the plating bath and for determining the thickness of deposit.

The amperehour meter, instead of indicating the number of amperes *being used,* as does the ammeter, registers the number of amperes that *have been used,* in terms of amperehours. Since the composition of any plating solution varies with the amount of current having passed through it, it is an easy matter to control any solution after it has been in use for a certain number of amperehours. This insures constant balance and bright plating solutions.

It is a simple matter to figure the amperehours used per square foot to determine the thickness of deposit. Thus the amperehour meter eliminates rejects caused by underplating as well as waste caused by overplating.

Write for catalog giving complete details.



Typical amperehour meter control of still tank plating.

LASALCO, INC.

Manufacturers and Distributors of Plating Equipment and Supplies

2822-38 LASALLE ST. • ST. LOUIS, MO.

necessary to paint in colored designs by hand. This usually involves baking on a coat of clear lacquer first, then painting in the design, allowing this to dry, and finally baking on a sealing coat of clear lacquer.

Antique and oxidized finishes are all produced in the brass plating department although sometimes these are put on white metal goods as well as brass.

The most important finishes in this group are antique gold and oxidized silver. The first step in making the antique gold is to put on the antique smut, which is essentially a soft dark green gold plate of low karat. The smut must be soft enough to relieve easily, but not too soft, and must adhere well to the metal underneath. Close control of composition is necessary to produce exactly the properties required. The smut is relieved by scratch brushing lightly on a wet, soft wire brush, or sometimes simply by hand rubbing with sodium bicarbonate so that the highlights are lightened and the background remains dark. (The operators do not call it bicarbonate but always speak of it as saliretis.) The final appearance of the antique finish depends to a large extent on the skill shown in relieving. After relieving, the piece is again gold plated, using a two stage process. Antique gold is not lacquered, and in general the base metal must not be too bright, because it is desirable to have the antique finish look dull rather than glossy.

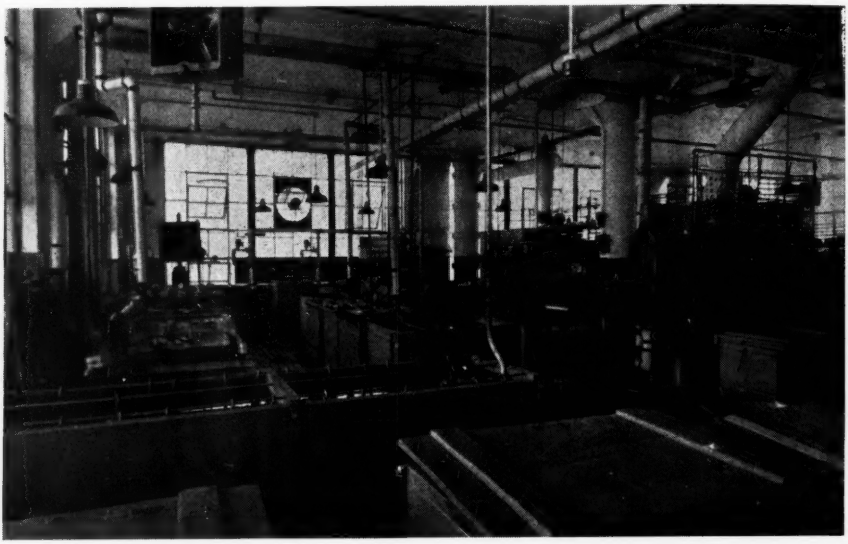
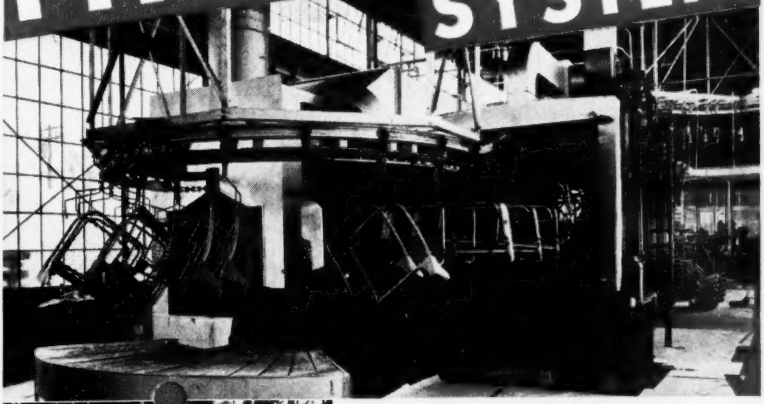


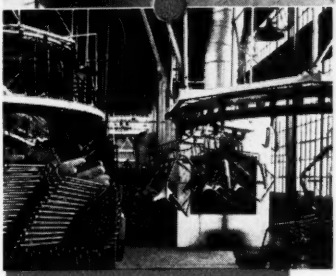
Fig. 7—Illustration showing a general view of the white metal plating department.

Oxidized silver finishes involve producing a black deposit on the silver which is relieved in much the same way as the smut for antique gold.

White metal goods are plated in a separate plating room. On account of the intricate shapes and numerous recesses found in these goods, the cleaning of white metal often requires

Another Complete Mahon FINISHING SYSTEM





Upper illustration shows product emerging from Flowcoat Paint Machine and entering Paint Drying Oven. Below: Outlet of Paint Drying Oven.

...engineered to do a Better Job at Lower Cost per Unit

Like hundreds of other Mahon installations, the automatic Finishing System, designed and installed by Mahon for the American Metal Products Co., was engineered to do a specific job efficiently and economically. More and more manufacturers are now turning their entire finishing equipment problem over to Mahon . . . the reason — Mahon's reputation for thorough planning and thorough engineering built on hundreds of highly efficient installations in every industry where finishing constitutes an important part of production. A highly specialized staff of Mahon engineers, backed by years of research and development, is ready to give you the benefit of their widely diversified experience. Write today — consultation will not place you under any obligation.

THE R. C. MAHON COMPANY
DETROIT — — CHICAGO
Designers and Manufacturers of Complete Finishing Systems and Other Production Equipment.

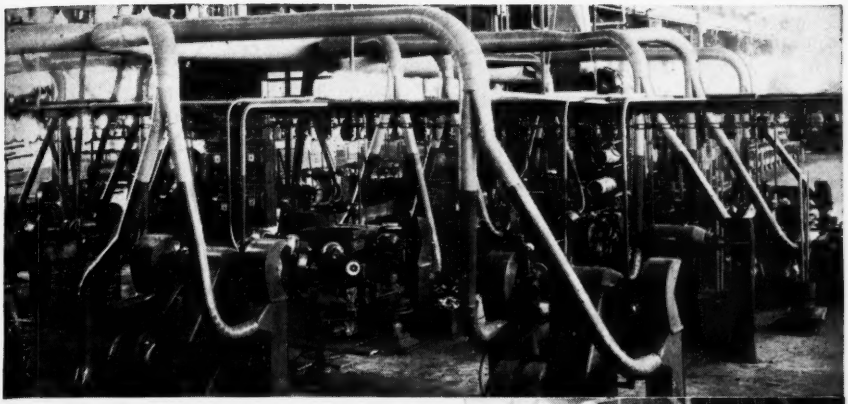
MAHON

Fig. 8—The operator shown here is removing workpieces from the bright nickel plating solution tank. Note the orderly appearance of this well-planned and organized section of the white plating department.

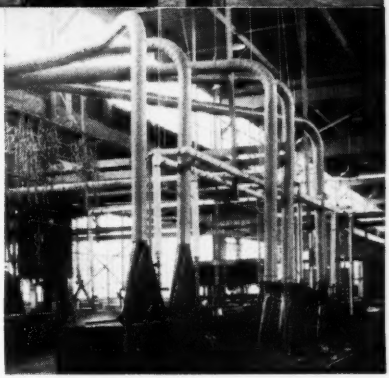
more hand labor than brass. In the brass department, all hand brushing has been eliminated, but this objective has not been obtained in the white metal department. The difficulty here is due in part to the fact that the cleaning materials used must be very mild in action, since otherwise they are likely to dim the luster of the white metal.

The problem of cleaning white metal without hand brushing has been given considerable study, and cleaners which do a minimum of damage to the luster have been developed. Degreasing between the cutting down and coloring operations makes it much easier to clean white metal without brushing it. If the variety of pieces to be handled were not so great, it would not be difficult to design a machine to eliminate hand brushing. But with as many designs as Cohn & Rosenberger, Inc., have, and the rapidity with which these change from season to season, a certain amount of brushing still seems to be the most economical way of cleaning white metal jewelry. In spite of this, Cohn & Rosenberger, Inc., have made a considerable improvement over previous practice in cleaning this type of work. Work on this problem is being continued and there seems to be good reason to look forward to further improvement.

The ordinary practice in cleaning white metal is to give it a brief soak in a soap and ammonia solution and brush it. Following this treatment, or some of the equivalent treatments that have been developed, the work is rinsed in water and then put in a mild electric cleaner for a short time. After another water rinse, the work is dipped in a sodium cyanide solution, rinsed again, dipped in hydrochloric acid solution, and then given a final rinse before placing it into the bright cobalt-nickel plating tank.



KIRK & BLUM SYSTEMS *"Clear the Air"* at Canadian Motor Lamp Company . . . .



The Kirk & Blum Dust Control System shown above serves the polishing and buffing departments at the Canadian Motor Lamp Company's Windsor plant. Two fans discharge the air into a centrifugal-type collector for removal of heavier dust, lint and tripoli, then through a cloth screen dust arrester for removal of remaining light dust. Acid fumes and vapors are removed from the plating department by the K & B Systems illustrated at the right.

Thus—here, as in plants of many industrial leaders throughout the nation, Kirk & Blum Systems help to protect men and machines, improve working conditions and morale, increase production, insure a better product, cut maintenance costs, save on insurance rates.

The services of Kirk & Blum Engineers are available to solve your dust control and fume removal problems. Details and interesting, illustrated books mailed on request. Write today —no obligation.

THE KIRK & BLUM MFG. CO. • 2816 Spring Grove Avenue, Cincinnati, Ohio

Chicago Representative: C. P. Guion, 1661 N. Milwaukee • Pittsburgh: The Bushnell Mchy. Co., 311 Ross Street • Louisville: Liberty Eng. & Mfg. Co., Inc., 1450 S. 15th St.

KIRK & BLUM

DUST AND FUME CONTROL

ENGINEERS AND CONTRACTORS

The preceding description, of course, applies to polished goods, that is to say, goods which carry polishing composition or red rouge. However, some of the white metal is not polished, but tubbed. Tubbed work, of course, presents less of a cleaning problem and starts directly with the electric cleaner treatment and goes through the same cycle from there on as described above.

The time of plating in the bright cobalt-nickel solution depends a great deal on the condition of the white metal surface as it goes into the tank. A highly polished surface does not require as long a plate as a surface which has only been tubbed. The brightness and luster of the piece after plating depend not only on the condition of the surface at the beginning, but also on the time of plating; the longer the work remains in the plating solution—that is to say, the thicker the deposit—the brighter it comes out.

The tank for the cobalt-nickel plating solution is the same size as the one in the brass department, and the equipment is a duplicate of that, including a separate continuously operating filter.

After nickel plating, the work is first rinsed in the nickel dragout recovery tank, and then given several more rinses in running water. The solution in the dragout tank is used to replace water evaporated in the cobalt-nickel plating tank.

After nickel plating, the greater part of the white goods is plated with rhodium. This operation is carried out in a 30 gallon jacketed Pfaudler tank. The equipment for rhodium plating in the white metal department is substantially the same as that in the brass department, but a different type of rhodium plating solution is used. In the white metal department, the rhodium solution is of the phosphate type, while in the brass department it is of the sulphate type. After rhodium plating, the work is rinsed in the rhodium dragout recovery tank, then rinsed several times in running water, then in a pressure spray rinse, and after that it is placed in the dryer. The dryer is of a cold blast-hot blast type, similar to the one in the brass department. After drying, the work goes to the unracking and inspection bench.

If the work is to be gold plated, the only difference in procedure is that it is plated in the gold plating tank and rinsed in the gold dragout recovery tank, instead of in the corresponding rhodium tanks. The gold plating tank, like the rhodium tank, is a 30 gallon jacketed Pfaudler tank. The control of the gold plating solution is carried on in the same way and with the same type of equipment as in the brass department.

In plating jewelry, and particularly white metal goods, several problems are encountered which are different from anything encountered in the usual plating room. For example, a large part of the white metal goods is set with stones. These stones have a foil backing, which may be affected by certain cleaning or plating solutions. Since the brilliance of the stones depends on keeping the foil untarnished, it is essential to maintain conditions which do the least possible damage to the foil.

Another thing that has to be watched for is cracking of the stones, due to sudden temperature changes. This is overcome by avoiding very sharp temperature changes. Thus, if it is necessary to pass from a very warm solution to a cold one, intermediate rinses are used and the temperature in each rinse is regulated, so that the drop in passing from one

temperature to the next is not pronounced enough to cause the stones to crack. When it is realized that a large proportion of the work is plated with stones already set, and that some of these stones are quite large and expensive, it can be seen that care in this matter is necessary to avoid considerable losses.

On the other hand, the stones are not always set before the plating operation. Cameos, for example, are usually set afterwards. Here again it is necessary to control the plating, so that the mounting is left in suitable condition for setting the stone. If the plate is too hard or too thick, or not ductile enough, it becomes a difficult matter for the operator to set the stone satisfactorily. The plate, moreover, must be adherent enough to permit the edge of the mounting to be turned over the edge of the stone. The operation is sometimes quite a severe one, and offers a searching test of the quality of the deposit.

The methods of jewelry finishing described in this paper represent an innovation so far as this industry is concerned, although they are based on practices that have been accepted in other industries accustomed to mass production methods. They have led to savings in labor and cost which have made it possible to put on a better finish and to raise the standard of manufacture for the type of low and medium priced costume jewelry which is most widely used today.

Anti-Corrosive Paints. An interesting leaflet describing the chemical actions of sub-oxide of lead in a paint film and how these can be used effectively in industrial maintenance problems is now being issued by Subox, Inc., 348 River Rd., North Arlington, New Jersey.
Copy free upon request.

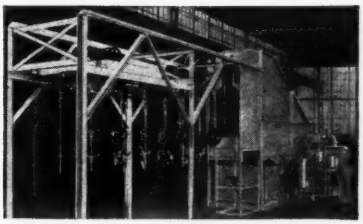
DETREX means . . .

ENGINEERED QUALITY
in all Cleaning and Finishing Jobs

Whatever your cleaning and handling requirements . . . whether for hand-operated or completely automatic metal cleaning and finishing equipment . . . Detrex Engineers will fit your needs, service your equipment, and give you unbiased recommendations.

The one complete source for Solvent Degreasers, Stabilized Safety Solvents, Alkali Washers, Compounded Cleaners and Strippers, Bonderite Equipment, Industrial Ovens, Dip Tanks, Wet Spray Booths, and Wet Spray Booth Compounds.

WRITE FOR DATA OR DEMONSTRATION.



ONE-DIP CONVEYORIZED DETREX DEGREASER EQUIPPED WITH CONTINUOUS FILTER AND SOLVENT STILL

DETROIT REX PRODUCTS COMPANY

13017 HILLVIEW AVE. *Branch Offices in Principal Cities* DETROIT, MICHIGAN

CLEANING AND PAINTING OF CAST PARTS PRIOR TO MACHINING

By C. C. Hermann

THE construction of rayon and silk spinning machinery requires duplicate manufacture of parts to a very large degree. For example, there are 200 spindle carriers on a single machine and a similar number of a dozen other parts. Each and every part must be perfectly smooth to prevent snagging of the strands of silk or rayon.

In other words, the castings must be thoroughly precleaned and the surfaces covered with a finish coating which will eliminate any tendency to catch the minute silk or rayon fibres. The finishing material used must not become soft or tacky when subjected to higher than room temperatures. Heavy applications of paint which might possibly hide any imperfections in the castings cannot be used. An example of the manner in which the problems encountered in the finishing of spinning machinery are solved is found at the plant of the Fletcher Works, located at Philadelphia, Pa.

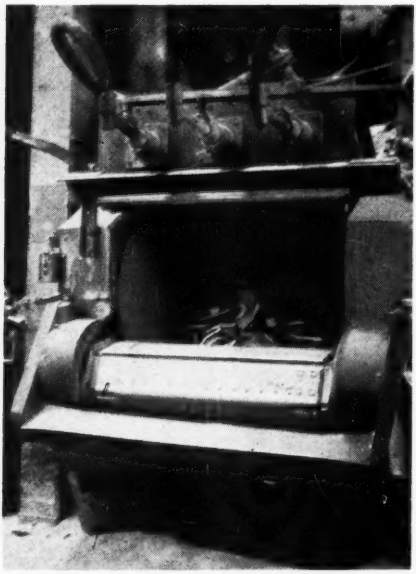


Fig. 1—A view of a Tum-Blast unit for cleaning castings.

The Fletcher Works has been manufacturing spinning machinery for over half a century. A characteristic feature of this type of machinery is the requirement that all parts used to make the machine must be finished and painted prior to the final assembly. In fact, most of the parts used in the construction of the machine do not enter into a subassembly which may be treated as a portion of the machine and shipped as such, but the individual pieces are assembled on the main frame of the machine and the machine is shipped as a complete unit. It is obvious, therefore, that each individual piece must be finished prior to assembly.

It is interesting to look into the manufacturing methods practiced, for here is a plant which is painting castings, steel, and other machine parts prior to machining operations. This procedure has been followed for nearly as many years as the plant

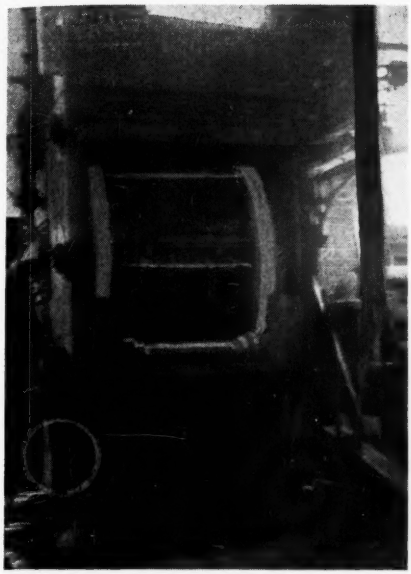


Fig. 2—Two streams of abrasive plus the tumbling action of the barrel cleans the castings prior to rumbling.

has been in production. The principal advantage of this method is that drilled and tapped holes, milled surfaces, and turned portions do not become coated with a paint film. Considerable savings are effected since it is unnecessary to remove paint film from machined surfaces.

To the average reader, it may seem a trivial matter and of no consequence whether machining precedes or follows painting. Long experience has proved to this company that it is better to finish the parts prior to machining. The manner in which the Fletcher Works finishes castings is described herewith.

The equipment used in the cleaning of castings is simple and of standard design. Figure 1 shows a view of the machine in which the castings are cleaned. This unit consists of a revolving barrel into which four streams of sand or abrasive shot are directed under high pressure. The parts to be cleaned are placed in the barrel and tumbled while at the same time the abrasive is forced into the barrel. The action of tumbling and blasting gives to this process its characteristic name of "Tum-Blast." In Fig. 2 is shown a Tum-Blast unit in which two abrasive streams are employed. The Tum-Blast operation removes sand, scale, and light fins.

Heavy fins, sprue marks, and gate fins are removed by the snag grinder operators shown in Fig. 3. After sand blasting and snagging, the castings are placed in a rumbler. Small stars and bits of iron are placed with the castings and the entire mass is revolved until the surfaces of the castings become smooth. The average time for rumbling varies from one-half to one hour.

All traces of the Tum-Blast operation are removed in the rumbling operation. The castings come from

Fig. 3—Snag grinders such as are shown in this illustration are used to remove heavy fins, sprue marks, and gate fins.

Fig. 4—The castings are placed on trays and then dipped into japan and placed on the rack shown herewith.

surfaces receive the same degree of surface finish.

After the parts are properly cleaned, they are taken into the painting department. At this point, the castings are arranged on trays which hold between 600 and 1,000 pieces and then immersed in a reservoir of japan. The trays are then removed and placed on a conveyor chain as shown in Fig. 4. From the chain conveyor, the trays are placed on specially designed racks which can be attached to an overhead trolley conveyor. The conveyor chain carries the racks into a drying oven. The drying oven is maintained at a temperature of 300 degs. F. and the racks of parts remain in the oven for a two-hour drying period. Some of the castings are placed on hooks and dipped into the japan individually. A view of a cluster of these

the rumbler with smooth and glossy surfaces, even to the deep corners and crevices at the base of lips and flanges. Paint that is applied to a sand blast casting has a flat surface appearance, but paint that is applied to a rumbled casting is smooth and glossy. This type of finish is the most desirable for the machine on which the casting is to be used.

Some parts are too large to be sand blasted in the barrels and such parts are placed on a large four-wheeled truck which is used to convey them into a cabinet-type sand blast machine. Inside the cabinet, the parts must be turned by hand so that all

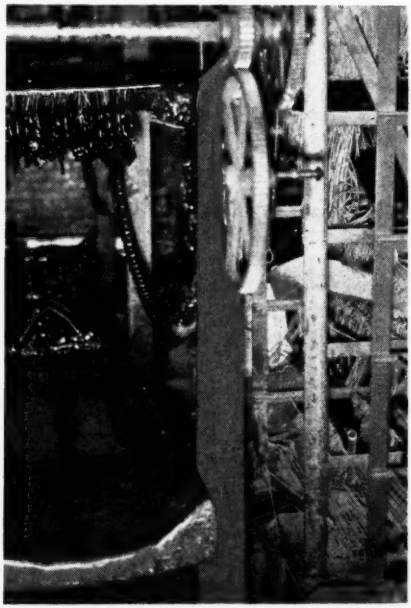


Fig. 5—Some parts are individually dipped and then hung on the conveyor shown here and allowed to drain.

Coming in January

OF PRODUCTS FINISHING

For Readers . . . Of unusual interest to all plant operating executives in the metal cleaning and finishing industry will be the January Annual Review Issue of PRODUCTS FINISHING. In addition to regular editorial features, important new developments of equipment, processes and supplies made for this industry during the past 12 months will be highlighted, making this number of special value to readers for frequent reference.

For Advertisers . . . This issue offers a forceful method of bringing news of equipment and supplies to PRODUCTS FINISHING readers. Take advantage of the added value of this Annual Review edition by scheduling your advertisement for appearance in this number . . . Send space reservation today!

PRODUCTS FINISHING
431 Main Street
CINCINNATI, OHIO

parts loaded on a conveyor chain is shown in Fig. 5. The conveyor carries them over a drainboard which can be seen in the illustration.

After the drying operation, the parts are transferred to the machine shop where the machining operations are performed on the painted parts. Figure 6 shows a drilling and tapping operation on a swing casting for a duplex spinning machine for rayon and silk. This particular piece requires a milled shoulder and milled spot at the base of the barrel as well as a drilled hole through the barrel. The milling operation is performed by the use of a hollow mill, 1⅜ in. outside diameter and 1 in. inside diameter.

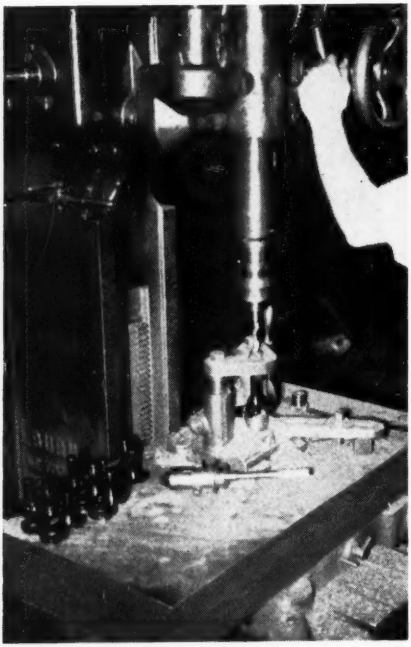


Fig. 6—The finished castings are drilled and tapped by an operator as shown in this illustration.

Unusual care is given to the handling of parts during machining and assembly to assure unmarred final finishes. Thus, when the completed unit is placed in operation, long service and trouble-free operation are the result.

Chemicals by Glyco. The latest edition of "Chemicals by Glyco" issued by Glyco Products Co., Inc., 148 Lafayette St., New York, N. Y., bears on the cover an attractive reproduction of the Perisphere and Trylon, theme emblem of the New York World's Fair, and an invitation to visit Glyco's offices.

Enlarged to over 70 pages, "Chemicals by Glyco" describes the emulsifying agents, synthetic resins, waxes, and plasticizers, the fatty acid esters of glycerine and glycols manufactured by the Glyco Products Co., Inc.

In addition, suggested formulae and other useful information for the manufacture of numerous types of products are contained in the catalog.

Manufacturers and chemists who desire copies of "Chemicals by Glyco" are invited to write to the Glyco Products Co., Inc., 148 Lafayette St., New York, New York.

Bristol Wide-Strip Pyrometers. A 36-page catalog presenting complete information regarding the entire line of Wide-Strip Pyrometer Recorders and Controllers manufactured by The Bristol Company, Waterbury, Conn., has recently been completed. The catalog contains a description of the fundamental principles of operation of these instruments. It also completely describes and illustrates the various operating units and special features of design. All of these facts are summarized for reference.

Complete details are also given regarding the various types of thermocouples and the charts, with ranges available. The catalog is well illustrated with sample records taken from applications. Representative charts, actual size, accompany each catalog.

A copy of this catalog, No. 1452, may be obtained upon request.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

NORTON SERVICE

. . . DISTRIBUTION

Factory, Branch Warehouse and Distributor Stocks

Right: Scene in the Chicago warehouse—typical Norton service branch

1. Large, well-filled stock rooms at Worcester; 2. Branch warehouse stocks in five industrial centers; 3. Distributor stocks in 150 key cities of the United States—it is these three elements that form the Norton distribution system and, meshing smoothly together, they assure prompt abrasive service the country over. And supplementing these stock facilities there are the manufacturing facilities of the Norton electric furnace plant and the processing facilities of the Worcester plant—the most modern equipment for producing abrasive grain in the shortest possible time.

NORTON COMPANY, WORCESTER, MASS.

G-101

NORTON ABRASIVES

BARREL FINISHING OF METAL PRODUCTS

Further Factors in the Barrel Cleaning of Metal Products

By H. LEROY BEAVER

IN the two papers immediately preceding the current issue, the discussion dealt with methods of barrel cleaning generally and factors in wetting, penetration, emulsification, diffusion and defflocculation as they are found in metal cleaning processes.

We have been asked the question of what difference, if any, there would be in the effect obtained by barrel cleaning parts that have been buffed or cut down with abrasives as distinguished from cold rolled steel with a fine and smooth surface finish. We have gathered that this question arose more often in connection with steel parts where the surface was such that it was necessary for a buffing operation to be performed in order to obtain a smooth bright surface prior to plating. In other words, this involves the smoothing of what would be otherwise known as "orange peel" surface, of which we expect to have considerably more to say in a later paper. For our present discussion, however, we can only touch on the condition of the surface as we find it following such an operation and wherein the generally accepted medium for use on the wheel is emery in some grease base combination. While it is not within our province to discuss factors contributing to the adhesion or lack of adhesion of a plate surface, we are inclined to agree wholly with the school of thought that realizes that steel surfaces which have been emeried are very likely to have surface cracks or checks, and imbedded in such checks and cracks will be found the residue of both abrasive and grease base. Such deposits are very difficult to remove, and if not removed will cause trouble at some later stage in the finishing process.

Barrel cleaning can never be the quickest form of cleaning, and should not be contrasted with the process of hanging a rack of work in a cleaning tank, introducing a current momentarily and then withdrawing the rack. While a barrel cleaning procedure would be slower in operation, we are satisfied from the experiments we have conducted that it would be far more thorough than tank cleaning.

One of the greatest difficulties in barrel cleaning has been the assumption of so many barrel operators that chip or flake soap, as generally supplied for barrel operations, was in it-

self completely sufficient for the work. We now know that it is nothing of the sort, and that alkaline builders must be used in order to gain any appreciable degree of effectiveness in any barrel cleaning operation. We must, of course, realize that in a cleaning process we must saponify such greases and oils as we find on the surface of the parts, and in order to do this, sufficient alkali must be present. The average of soaps being deficient in this respect, builders should be added and they can be added in the form of sodium hydroxide, trisodium phosphate, sodium carbonate or the more newly developed silicates, combined with appropriate wetting agents. Provided we do this, we not only maintain the normal alkalinity of the original soap for cleansing but we add sufficient alkali to enable us to form soaps in situ from the soluble greases and oils we find in the parts to be cleaned. But such soaps are not formed instantaneously and a certain time cycle must be provided to complete the saponification. Thus, we have not only the original soap itself, but the very helpful addition of the soaps formed in situ which add very materially in the saponification of residual grease which transform into a soap that can be more readily rinsed away. The conception that chip or flake soaps dissolve and go into solution instantaneously is also a fallacy. Some of the foremost soap chemists in the country have assured us that in barrel procedure, even under agitation, such soaps will require anywhere from three to five minutes to go completely into solution even when operated in hot water, and unless they are specially made up for use in cold water an even longer operating cycle will be required. Whether the water used is hard or soft also has a very important bearing on the cleaning cycle. If hard water is used, even with additional alkaline builders, additional alkali is required to first soften the water. One of the first requirements is to provide for the water softening factor before determining the quantity of builder to use.

In spite of all that has been said about the subject of water in barrel

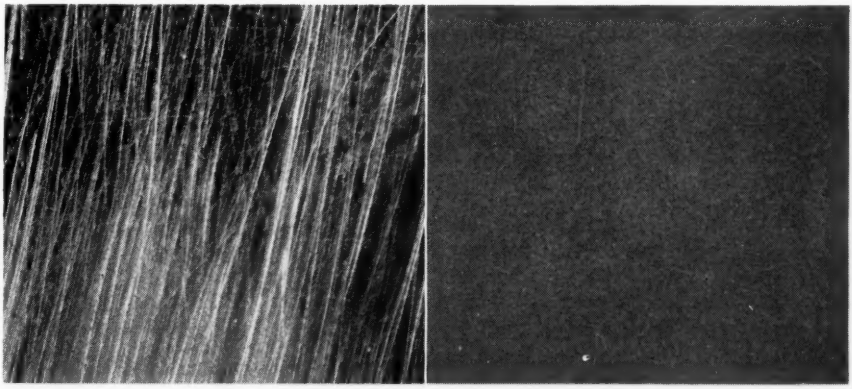


Fig. 1—At the left is shown a magnification of the surface of a metal part which was cleaned electrically. At the right is shown a magnification of the surface of a metal part which was barrel cleaned.

finishing procedures, we continue to find water of ordinary faucet temperature in use whereas the water should be at least 160 degrees to insure the most satisfactory results. The plant that has a plentiful supply of soft hot water has already gone a long way toward the solution of most of its barrel cleaning problems. Aside from faucet temperatures, water is more often naturally hard than soft, and hard water reacts with a certain amount of soap to form a sticky insoluble compound called lime soap. This lime soap adheres to the surface of the metal parts, and while it is very difficult to remove even with hot water, it is far more so when water of ordinary faucet temperature is all that is available. The old familiar complaint of "white specks" is simply an illustration of this lime soap deposited in minute specks on the surface. To prevent the formation of such soaps in the barrel finishing process, we advocate the addition of chemicals which will provide for diffusion of such soaps.

We have seen so much of the condition where ordinary soaps are sought to be used without additions, that we are constrained to believe that many of the difficulties ascribed to all sorts of things are in reality, in the last analyses, due solely to hard water. Of one thing the reader may be certain in barrel finishing procedure and that is when you operate with hard water you will not get a satisfactory suds for holding the removed soil in suspension until the hardness of the water has used up enough soap and alkali to soften it. Where barrel finishing is a regular part of the production procedure and where only hard water is available, it is surprising to us, in the many plants we have visited to find so few mechanical water softeners in use. When we consider that operating time is materially affected, that barrel finishing costs as well as costs of

Illustration showing an American Optical Company research scientist in industrial hygiene testing the filtering efficiency of a newly-developed respirator by means of an electrical precipitator.

(Photo Courtesy American Optical Co.)

INDUSTRY AFTER INDUSTRY
HAS FOUND THAT IT PAYS TO
Bonderize

Hope's windows were selected by Russell T. Pancoast, Architect, for above residence at Ft. Lauderdale, Florida. All Hope's windows are now Bonderized in their modern plant at Jamestown, N. Y.

ONLY a short time ago Bonderizing was first introduced in the steel window industry. This proved to be such a successful quality and sales feature that within a matter of months it became practically standard practice in the field. Producer after producer equipped to apply this rust-inhibiting, paint-holding process to his production. So it has gone with automobiles, electric refrigerators, washing machines and many other industries.

It pays to give customers known improvements that they understand and appreciate.

Parker Processes are known the world over as most effective methods of inhibiting rust and holding paint to steel for long, durable life. Maybe you, too, can Parker Process your production and gain a sales advantage.

PARKER RUST PROOF CO., 2172 E. MILWAUKEE AVE. DETROIT, MICH.

Ask for This Book

Send for a copy of the new Bonderizing Catalog showing the many benefits provided by this Parker Process.

PARKER
Processes **CONQUER RUST**
BONDERIZING • PARKERIZING

soap and alkalis are also directly affected, the installation of water softening equipment would be both economical as well as practical, even though the normal water supply is only two or three grains hard, and infinitely more so in such cases where water hardness ranges from sixteen to twenty-five grains of hardness per U. S. Gallon. But even though you do install or have already installed a water softener, do not assume that it requires no attention. If a softener is allowed to operate too long without regeneration or if the water is forced through too rapidly, it will not deliver zero soft water. It has been found to be good practice to check the water coming through the softener periodically with standard soap solution. (This was completely described in a previous paper in the series, and to those readers who missed it, the formula for the soap solution as well as instructions in its use will be gladly supplied if you will address your request to PRODUCTS FINISHING.)

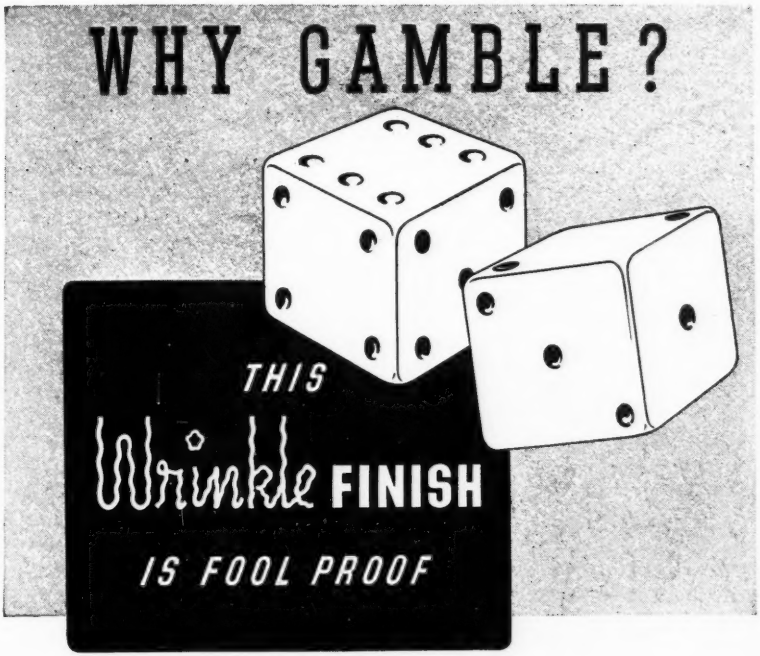
As to the wetting agents used in combination with the alkaline builders, we have concentrated on two, one a hymolal salt, and the other a form of sulfonated ether. Both of these when operated with soaps build up a great quantity of suds which is held very stable and both eliminate lime soap difficulties. We cannot see how they could be used, however, with alkaline cleaning, either still or electrically if any considerable amount of agitation occurred, because such agitation would result in a mountain of suds that would overflow the tank and render working conditions all but impossible. In barrel cleaning procedure, however, we need not seriously consider this factor, if at all, because the parts, as well as the solution are all confined in the barrel, and the lather formed in the process is sufficiently dense to hold in suspension the residual soil loosened from the surface and from the pores in the metal itself.

Since the beginning of this discussion on barrel cleaning, we have had several letters asking us whether in the carrying out of this process parts would not become scratched and marred. Our answer to this is that there would be no more scratching than would be met with in a somewhat similar operation of barrel plating, and the probabilities are that there would be none at all, for in the barrel cleaning operation we would have lubrication action of the soapy water film which would go very far to prevent any condition of that kind.

Then too the question arises, what is the difference in appearance between the surface of a part that has been buffed and cleaned and a part that has been barrel cleaned and finished for plating in one and the same operation. One of our readers has sent us two photographs which are illustrated in Fig. 1 of the surface of metal parts, one of which was cleaned electrically in a tank in the customary way and the other being barrel cleaned prior to plating. We believe the photographs will amply illustrate the difference in the character of the surface on which to deposit a plate.

We realize of course that there are two schools of thought on the subject of a proper character of surface on which to deposit plate, one insisting on a surface as smooth as possible and the other on a surface that has been etched or otherwise roughened to provide a better bond for holding the plate. On this we feel that we could do no better than to quote one of our foremost authorities on plating procedure, Mr. Frank Mesle, of Oneida Community, as follows:

WHY GAMBLE?



THIS
Wrinkle FINISH
IS FOOL PROOF

Regardless of variations in humidity or furnace conditions, Wrinkle-Cote produces in a single coat a perfectly uniform, close grained, soft lustre finish of better gloss and color than heretofore thought possible. Manufactured under a New Wrinkle Inc. License and in Watson-Standard's "Prescription Finish" Plant, Wrinkle-Cote offers you a definitely better product at the right price . . . Write us today for sample.

WRINKLE • COTE

THE WATSON-STANDARD CO.

Manufacturers of
PAINTS . . . VARNISHES . . . INDUSTRIAL FINISHES AND LITHOGRAPH COATINGS

TOUGH JOB HEADQUARTERS

℞ Prescription Finishes

Give us your metal coating problem. We guarantee you an answer based on your conditions, and not just a standardized formula.

FACTORY AND GENERAL OFFICES: PITTSBURGH, PA.
WAREHOUSES: BOSTON • BUFFALO • DETROIT

"It is generally assumed that the smoother the surface the more difficult it is to get an adherence of the deposit. Frequently, an acid dip is suggested to etch the surface to give the plate a chance for anchorage. This seems very logical if plating is held by a mechanical bond, and no doubt some plating is. But when this is so, the plating at best is poorly adherent. It is my experience that a perfectly adherent deposit can be plated on the most highly finished surface. In fact, under the same cleaning conditions the adherence is better on the highly finished surface than on an emeried, brushed, or satin finish surface."

And Mr. Mesle goes on to say:

"There is no doubt that cleaning the surface is a very important factor in producing an adherent deposit. The surface must be free from dirt, grease, and oxide films, and must remain clean until metal is actually deposited. The fact that the surface must not only be made chemically clean, but must remain so until the metal is deposited, **cannot be overemphasized.**"

To that school of thought in metal finishing who believes that a chemically clean smooth surface provides the best base on which to deposit a plate, then barrel cleaning offers possibilities that could not be duplicated in any process of still tank or electrical cleaning, because the full extent of the possibilities of wetting, detergency, saponification, diffusion and deffloculation can be realized by the barrel method. Coupled with this, we would have the further and what we consider very essential factor and that is the effect of fluid friction as an aid to remove from the surface and from the pores of the metal itself those unwanted particles of dirt, grease or soil that plague the plater continuously.

In connection with the addition of alkaline builders to soaps in barrel cleaning procedure, there may at times be noticed a slight alkaline film on the surface of the parts after rinsing, but this condition has never presented any great difficulty. A simple dip in what might be termed a "sour" solution is all that is required for dissolution of any such film. There is no necessity for the use of any of the corrosive types of acid in making up such a solution which might give the surface an etched finish. Acetic or citric acid in a solution that will have a reading of pH 5 will be sufficient, followed by a clear water rinse.

We do not, of course, dispense with the steel burnishing materials in carrying out a barrel cleaning process, and the probability of trapping dirt, grease or soil in pores of the metal is most remote, because the plasticity of the plated or other surface is not altered so rapidly but that the cleansing agents will have ample time to surround and loosen particles of soil and also to saponify grease and oil which would be carried in suspension in the cleaning solution.

The cycle of operation in a barrel cleaning process is equally as simple as would be a barrel burnishing operation.

When we speak of the beneficial effect of fluid friction in a metal cleaning process we do not in any sense refer to the frothing or foaming action as noted in an electrical tank cleaning procedure. We do not agree that this effect is "fluid friction" in the sense that that term is understood when it is considered in connection with the study of hydrau-

lics of which we consider it a part, and certainly not the type of fluid friction to which we refer in the use of this term in connection with the barrel cleaning cycle.

As to the best type of barrel to be used in barrel cleaning, this we leave to the barrel manufacturer in the hope that some one of them will finally develop sufficient ingenuity to produce for the metal finishing industry something in the way of a barrel that will be different from the present stereotyped forms that are commonly offered for any and every barrel finishing purpose.

Casein and Its Industrial Applications. The book department of Reinhold Publishing Corporation, 330 West 42nd St., New York City, is now publishing the second edition of "Casein and Its Industrial Applications" by Edwin Sutermeister and Frederick L. Browne. The 435 pages of this book are packed full of the latest information available on the various applications of casein.

An entire chapter devoted to casein paints will be of unusual interest to finishing department executives. Included in this chapter are general principles of paint information, the nature of pigments and vehicles, proportions of pigment and vehicles, effect of volume relation on structure of coatings, and so on.

Brown Thermometers and Pressure Gauges. The Brown Instrument Company, Wayne and Roberts Aves., Philadelphia, Pa., has just published a colorful booklet featuring a new line of thermometers and pressure gauges. This booklet describes vapor-actuated, gas-actuated, and mercury-actuated types of Brown thermometers. Indicating and one, two and three pen recording models are illustrated.

The modern rectangular case of the instruments which was styled by Henry Dreyfuss, is said to give added beauty and distinction. A copy of this booklet will be sent free upon request.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

Walker's Chlorinated Rubber Finishes stand *all TESTS* 100 per cent!

This outstanding new finish, developed at the Walker laboratories, is used on metal over a primer. Used with highest satisfaction on metal objects requiring a good durable finish. Applied by spray, or dipping. Here are a few strong points:

- Has drying qualities of lacquer. — Whether air dried or force dried, the sterling qualities in these finishes are never destroyed.
- Has extreme outdoor durability. Positively resists acids and alkalies.
- Gives a high gloss, or can be modified to a dull finish. Is not high priced. We assure prompt deliveries.

Walker's Chlorinated Rubber Finishes can be used to good advantage on your product.

LET US SEND DETAILS AT ONCE

H. V. WALKER CO.

FINISHES TO FIT YOUR PRODUCT

OFFICES AND PLANT: **ELIZABETH, N. J.**

The Emblem of Quality in Finishes

New England Representatives: BROWN & DEAN CO., Providence, R. I.

AIRWAY *Ventilated* BUFFS

To the Executive.

To the Purchasing Agent.

To the Polishing Room Superintendent.

Gentlemen:

It may be you don't even know what we are talking about because you have never used AIRWAY VENTILATED BUFFS, but that's no excuse. If you buy AIRWAY VENTILATED BUFFS then you will know what we are talking about when we say we will save you 50% on your cotton buff wheel costs.

JACKSON BUFF CORPORATION

L. W. MacFarland

President.

JACKSON BUFF

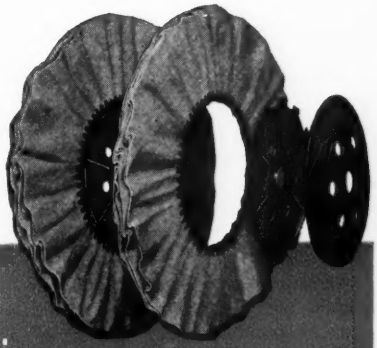
21-03 41st AVENUE

AIRWAY *Ventilated* BUFFS

We claim 50c on the dollar saving. We don't care whether it is $1,000.00 or $10,000.00. You can't with safety challenge that statement. We can with safety make it.

Warning Notice

Jackson Buff Corporation of Long Island City, New York, has rights to U. S. Patents Nos. Re 19,894 and 2,140,208 which have broad claims covering an air-cooled buff having means for the admission of air through the sides of the buff. Owner intends to protect all rights and stop infringement.



CORPORATION
LONG ISLAND CITY, N.Y.

PROTECTIVE ENAMEL FINISHES FOR MAGNESIUM BASE ALLOYS

By E. E. Halls
England

A WIDE series of metals which have magnesium as the main constituent are finding their way into diverse engineering industries. Such metals are marketed under the trade names of "Dow," "Elektron" and so on. The widespread use of these metals has introduced problems of finishing that have not been heretofore experienced. Extreme lightness combined with good strength is the chief advantage of the magnesium base alloy. Not only are airplane parts fabricated from these materials, but also the component parts for transport vehicles, moving members of automatic machinery, and other items for the domestic markets.

As a result of the demand for the magnesium alloys, industrial metal-finishing departments are being called upon to provide magnesium finishing as a regular practice. Durable electroplate coatings have not as yet been devised, therefore lacquers, paint, and enamels must be used to serve the purpose. Actually, this is no drawback because protective finishes are usually obtained which possess utilitarian as well as decorative value.

The critical feature in enameling magnesium alloys is determined by the fact that magnesium is highly electropositive and that, with aluminum and zinc, it represents the most electropositive alloy used in manufacturing. Years of experience have shown that zinc, for this same reason, is very difficult to enamel or paint with regard to adhesion and that success can only be achieved by converting the zinc surface to an inert layer by a pre-treatment such as Bonderizing.

In the case of aluminum, due to the fact that a self-healing oxide forms on the surface, finish difficulties are not so acute. The oxide film is capable of protecting the material in a considerable measure under normal conditions. Magnesium, however, is the most electropositive of the group and it forms no protective or self-healing oxide film and therefore is gradually and readily corroded under even moist atmospheric conditions. When magnesium is coated with organic finishes, however efficient may be the precleaning operations, lasting finishes are uncertain. Not only can moisture vapor penetrate the coating, react with the active base material, and lift the finish but in addition, the magnesium will tend to react with anything in the nature of an acid or fatty constituent such as oil or resin in the coating, thus causing embrittlement, loosening, and flaking. Therefore, it is necessary, apart from the normal degreasing and cleaning operations, to render the metal inert for the permanent prevention of such activity. This criterion has been met by a number of aqueous pretreatment processes, mostly having a chromate

Sample No.	Material	Chemical Pre-Treatment	Enamel Finish	Performance under Salt Mist	
				Edge Attack	Surface Attack
1	Casting	None	2 coats blue cellulose	Slight in 1 day Heavy in 3 days	Heavy in 3 days
2	Casting	Chromated	2 coats blue cellulose	Slight in 3 days Very severe in 14 days	Slight only in 14 days
3	Casting	None	2 coats black synthetic	Slight in 3 days Very severe in 5 days	Slight in 5 days Heavy in 7 days
4	Casting	Chromated	2 coats black synthetic	Slight in 3 days Very heavy in 5 days	Slight in 5 days Heavy in 14 days
5	Casting	None	Chromate primer 1 coat blue synthetic	Very slight in 3 days Still slight in 21 days	None in 21 days
6	Casting	Chromated	Chromate primer 1 coat blue synthetic	One point of slight attack in 14 days No change in 21 days	None in 21 days
7	Casting	None	Oxide primer 1 coat blue synthetic	Very slight in 3 days Heavy in 10 days	Slight in 10 days Heavy in 14 days
8	Casting	Chromated	Oxide primer 1 coat blue synthetic	Slight in 10 days Marked but not heavy in 21 days	None in 21 days

Fig. 1—Table listing the performance of enameled magnesium alloy in salt spray atmosphere.

base. Many of these processes have been patented.

The aqueous chromate pretreatments give some measure of safeguard in so far as they do form a relatively inert film upon magnesium which can protect to some degree against adverse exposure. As a base for enamel, such a treatment is indispensable. All of the pretreatment processes require immersion of the cleaned work under simple but controlled conditions. The various solutions differ slightly in makeup, operating temperature and time, and in the effect upon dimensions. Where a dimensional loss of as much as 0.003 in. is of no consequence, from one-half to two minutes immersion in a solution of one and one-half pounds commercial sodium dichromate and one and one-half pints commercial concentrated nitric acid per gallon of water at room temperature is suggested. Thorough rinsing of the parts and complete drying should follow immersion in this solution. The solution itself can be maintained by suitable additions as would be required by periodic analyses.

When parts which are machined to close accuracy are involved, a less active process can be used. For example, 20 to 60 minutes immersion in a solution of four ounces ammonium sulphate, four ounces sodium dichromate and one-third fluid ounces of 0.880 ammonia per gallon of water is rec-

Sample No.	Material	Chemical Pre-Treatment	Enamel Finish	Performance in Humid Atmosphere	
				Edge Attack	Surface Attack
9	Sheet	None	2 coats blue cellulose	Heavy in 7 weeks	Slight in 7 weeks Heavy in 14 weeks
10	Sheet	None	2 coats blue synthetic	Heavy in 7 weeks	Heavy in 7 weeks
11	Sheet	None	Oxide primer 2 coats blue cellulose	Slight in 7 weeks Heavy in 14 weeks	None in 14 weeks
12	Sheet	Chromated	Oxide primer 2 coats blue cellulose	Slight in 26 weeks	None in 26 weeks
13	Sheet	Chromated	Oxide primer 1 coat blue synthetic	Very slight in 26 weeks	None in 26 weeks
14	Sheet	None	Chromatic primer 1 coat blue synthetic	Very slight in 26 weeks	None in 26 weeks
15	Sheet	Chromated	Chromatic primer 1 coat blue synthetic	None in 26 weeks	None in 26 weeks

Fig. 2—Table listing the performance of enameled magnesium alloy in hot and cold humid atmosphere.

ommended. This solution should be operated at slightly below the boiling point and following immersion the parts subjected to this solution should be thoroughly rinsed and dried. Analytical control can be exercised to maintain the pH value between 5.6 and 6.2, using additions of equal volumes of nitric and sulphuric acids.

Summarized in the accompanying tables are the results of exposure tests on specimens of magnesium alloy sheet and castings finished by various methods. Figure 1 shows a table which refers to exposure under salt spray conditions. Figure 2 shows a table which refers to fluctuating conditions of warmth and moisture. Figure 3 shows a table with reference to open weather conditions.

The specimens used in this series of tests include finishes with or without a preliminary treatment by an aqueous chromate solution and both cellulose and baking enamels. Further, the tests include specimens having specially selected primers of the red oxide of iron and the yellow chromate of zinc varieties.

The salt spray test consisted in exposing specimens to the spray from a 20 per cent salt solution atomized with compressed air. The salt solution was prepared from ordinary salt dissolved in distilled water. The compressed air was cleaned by passing it through a filter of glass wool and by bubbling through water and then using it at low pressure. The atomizer of the salt spray unit was situated at the base of the cabinet in which the specimens were exposed, either suspended from glass rods or obliquely located on glass shelves. The shelves also served the purpose of baffling heavy drops of spray. A single day's exposure consisted of eight hours in the cabinet with the spray operating and the remainder of the day in the

Sample No.	Material	Chemical Pre-Treatment	Enamel Finish	Performance in Open Weather	
				Edge Attack	Surface Attack
16	Castings	None	2 coats blue cellulose	Slight in 26 days Heavy in 84 days	Slight in 84 days
17	Castings	None	2 coats blue synthetic	Slight in 26 days Heavy in 84 days	Slight in 84 days
18	Castings	None	Oxide primer 1 coat blue synthetic	Slight in 60 days Heavy in 84 days	None in 84 days
19	Castings	None	Chromate primer 1 coat blue synthetic	Slight in 84 days	None in 84 days
20	Castings	Chromated	2 coats blue cellulose	Slight in 26 days No change in 84 days	None in 84 days
21	Castings	Chromated	2 coats blue synthetic	Slight in 26 days No change in 84 days	None in 84 days
22	Castings	Chromated	Oxide primer 1 coat blue synthetic	None in 84 days	None in 84 days
23	Castings	Chromated	Chromate primer 1 coat blue synthetic	None in 84 days	None in 84 days

Fig. 3—Table listing the performance of enameled magnesium alloy under open weather conditions.

salt laden atmosphere with the atomizer off. During the exposure, short periods of time were required for washing, drying and examining the specimens.

The hot and cold humidity test was designed to simulate tropical conditions. Approximate conditions were obtained in a cabinet in which humidity was produced by trays of water located at the base and temperature control was obtained by electric heaters with external variable resistances. A slow-moving fan assured uniformity of atmosphere. The specimens to be tested were suspended in the upper half of the cabinet. The actual conditions arranged for were 130 to 140 degs. F. during an eight-hour day, thus producing a humidity of approximately 85 per cent. During the night period, the cabinet was permitted to cool off to atmospheric temperature which resulted in a rise in humidity to 100 per cent and a consequent condensation of moisture on the test specimens.

The open weather exposure consisted in suspending the specimens rigidly from a framework on a flat roof. By placing the framework in such a way as to face southwest, full exposure was obtained.

All types of exposure indicate the benefit to be obtained by the use of chromate pretreatment or a special primer. Thus, from Fig. 1 we find that Specimen 2 was markedly superior to Specimen 1, both having cellulose finishes and the difference being only in the aqueous chromating. The same comparison is also true for

	Blue Cellulose Enamel	Black Synthetic	Oxide Primer	Chromate Primer	Blue Synthetic
PHYSICAL					
Specfic gravity at 25 deg. C.	1.050	1.130	1.530	1.125	1.080
Viscosity centreposes at 25 deg.	1500	160	1600	190	210
COMPOSITIONAL, PER CENT	65.0	54.5	32.5	55.5	41.5
Volatile Spirit	35.0	45.5	67.5	44.5	58.5
Total Solids	100.0	100.0	100.0	100.0	100.0
Stoving Conditions	All 30 minutes at 250 deg. F.				
Type	High Consistency Cellulose	Urea Synthetic	Glyptal Synthetic	Glyptal Synthetic	Glyptal Synthetic

Fig. 4—Table listing the characteristics of the primers and enamels used on the test specimens.

Specimens 3 and 4 which were finished with baked black synthetic finishes.

Specimen 5 demonstrates the extraordinary improvement obtained by the use of a chromate primer, even without chromate pretreatment. Specimen 6 demonstrates the advantages of the use of both a chromate primer and a chromate pretreatment.

Similarly, Specimens 7 and 8 show that an appreciable advantage can be obtained by using an ordinary red oxide variety of primer. In this case, however, the benefit is not quite so marked as with the zinc chromate type.

The range of Specimens 9 to 15 are on sheet material which, under less drastic conditions of humidity, bear out exactly the same conclusions as obtained for the casting Specimens 1 to 8. Likewise, the data given briefly for Specimens 16 to 23 under weather conditions corroborate the same findings.

Laboratory details are given in Fig. 4 regarding the type of enamel employed for the test. The magnesium alloy analyses are listed in tabular form in Figure 5.

	Castings	Sheet
Aluminum	7.5%	5.5%
Manganese	0.45%	0.42%
Copper	0.15%	Nil
Iron	0.05%	0.03%
Silicon	Traces	0.02%
Lead	Nil	Nil
Magnesium	Remainder	Remainder

Fig. 5—Table listing the alloy composition of the test specimens.

Much work has been done in producing a utility range of magnesium base alloys, and users have gone a long way toward obtaining the best from the metals available. Still more will be evolved in all directions. The foregoing broadly illustrates in a brief manner the present position with regard to enamel finishing, and demonstrates that satisfactory results are obtainable without departing far from normal practice. An aqueous chromate pretreatment and a synthetic zinc chromate primer provide the ground work. Finishing coats may then be cellulose or baking, synthetic, oil, crystal or crinkle. In this manner, all types of workpieces can be finished without any deviation from the present finishing procedure.

Mention PRODUCTS FINISHING when writing to advertisers.

Binks Catalog No. 75. A 1940 Catalog and Data Book on spray painting and finishing equipment is now being issued by Binks Manufacturing Company, 3114-40 Carroll Ave., Chicago, Illinois.

Consisting of 104 factual and highly illustrated pages, the catalog is organized for ready reference purposes. It gives the answers to everyday finishing problems, reports new developments in spray painting equipment, gives prices, and provides engineering and performance data on all types of spray guns, spray booths, air compressors, painting outfits, extractors, respirators, and hose.

This catalog will be sent free to all those who request it upon their company letterhead.

We Improved Upon the Camel. Humidifying systems for industrial plants where winter heating absorbs too much moisture from the atmosphere, causing rejections and affecting production in various ways, is described in this interesting six-page folder which is now being issued by Spray Engineering Company, 120 Central St., Somerville, Mass. The humidifying system is easily installed in the plant and is said to have low initial and maintenance cost.

A copy of "We Improved Upon the Camel" will be sent free upon request.

Manhattan Rubber Products for Industry. Printing of the Fourth Edition of "Manhattan Rubber Products for Industry," a condensed catalog of mechanical rubber goods, has been completed by The Manhattan Rubber Mfg. Division, 94 Townsend St., Passaic, New Jersey.

Described in this new catalog are hundreds of mechanical rubber products and special items manufactured by Manhattan. Particular emphasis is given belting, hose, packing, molded rubber goods, industrial asbestos friction material, rubber roll coverings, tank linings, and abrasive wheels. The catalog also contains transmission belt engineering data and technical information on other products.

Copy free upon request.

Face Shields. A 4-page catalog now being issued by Boyer-Campbell Company, 6540 Antoine St., Detroit, Mich., features seven models and 15 different numbers and describes in complete detail the right face shield for the job. Due to complete interchangeability of parts, some models may be adjusted to almost every industrial need, according to the information in this catalog.

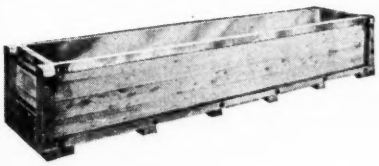
The Boyer - Campbell Company has specialized in safety equipment for more than 20 years and manufactures safety tongs, vacuum lifters, sheet metal lifting hooks, guards, ejectors, gloves, and so on.

Copy of this catalog will be sent free upon request.

Controlling Processes. A folder presenting concise descriptions of methods for controlling the pH of a solution by means of the Taylor Slide Comparator is now being issued by Wilkens-Anderson Company, 111 N. Canal St., Chicago, Ill. With the Taylor Slide Comparator, acidity and alkalinity can be accurately expressed and recorded in numerical figures.

Taylor Slide Comparators are said to be simple in operation and can be used in plants and laboratories by men without technical training.

This folder is an illustrated short story explaining how easy it is to use the Taylor Slide Comparator. A copy will be sent free upon request.



WOOLFORD WOOD TANKS

Specially designed for all steel treating operations

YOUR INQUIRIES SOLICITED

G. WOOLFORD WOOD TANK MFG. CO.

DARBY Since 1854 PENNA.

News OF THE INDUSTRY

Detroit Chapter of A.E.S. Plans Third Annual Educational Session

The Detroit branch of the American Electro-Platers' Society is planning to hold a Third Annual Educational Session and Dinner Dance at the Hotel Statler, Detroit, Mich., Saturday, December 9, 1939.

Included in the list of speakers who will assist at this session are Dr. Colin G. Fink, Dr. A. Kenneth Graham, and Mr. T. F. Slattery. Dr. Fink will speak on "The Electrodeposition of Manganese." Dr. Graham will conduct a discussion of electrolytic films, and Mr. Slattery will speak on "Electrolytic Processes as Applied to the Production of U. S. Currency, Bonds, and Stamps." The cost of the dinner dance is three dollars per person and the committee in charge of arrangements requests that reservations be made at an early date.

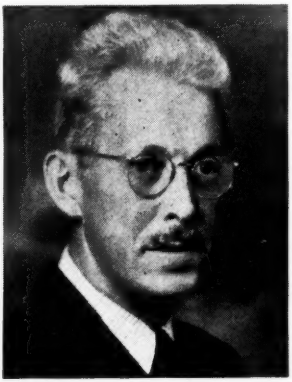
Stanley P. Rockwell Winner of Sauveur Achievement Award

Stanley P. Rockwell, Hartford, Conn., was presented with the Albert Sauveur Achievement Award at the Annual Convention of the American Society for Metals held in Chicago. The basis for the award is the Rockwell Hardness Tester.

Mr. Rockwell is the president of the company which bears his name. The award which Mr. Rockwell received is in memory of Albert Sauveur, former professor of metallurgy at Harvard University who passed away last January.

The Sauveur Award is not necessarily made each year. As provided in the A.S.M.'s constitution, the award is given to a present or former member of the Society only after the pioneering work has been proved to conform to the purposes for which the award was established.

The award committee was made up of William P. Woodside, president of the A.S.M., and all living past presidents of the society who met prior to the Annual Convention to consider a year ahead the eligibility of candidates for the award. The decision is reached by letter-ballot not later than June 1st of the year following the convention.



Stanley P. Rockwell

Rouge Firm Buys Stratford Plant

The purchase of the former Elmwood Button Company plant, Longbrook Ave., Stratford, Conn., by The Roberts-Rouge Company, 247 Connecticut Ave., Bridgeport, Conn., was announced by the Knight Realty Company which handled the transaction, with Robert L. Walsh as broker for the owners.

The property consists of an acre and a half of ground with a concrete and steel building which will double the capacity of the present plant now occupied.

The Roberts Rouge Company, headed by Theodore Onkey and Frank Comer, has commenced to move equipment into the building and expect to be completely established in their new location by December 10, 1939.

Exposition of Chemical Industries

Over 40 industries, producing chemical materials and equipment, will display their newest products at the Seventeenth Exposition of Chemical Industries. The Exposition, for which nearly 300 exhibitors have already engaged space, will be held at Grand Central Palace during the week of December 4 to 9, 1939.

Chemical Research, throughout all industries in the United States, received its first big incentive in the World War crisis. Under pressure it established a world position which it has maintained ever since. Each year has brought new and greater achievements for the health, comfort, and safety of the world. The Exposition of Chemical Industries, established in 1915, has played an important part in this progress.

In addition to the chemical raw materials and manufactured products which the Chemical Industry will exhibit at the Exposition, will be many displays devoted to metals and alloys; also to the new synthetic plastics and their versatile applications. Plant machinery and equipment, applicable to each of the unit processes of chemical engineering, will also be shown.

Hilo Sales Conference

An important conference of Hilo Varnish Corporation Eastern sales representatives was held at the Brooklyn plant and main office at 42-60 Stewart Avenue on Tuesday, October 17th, with Dr. Mattiello, industrial sales manager, presiding. The session was opened with an address of welcome by the president, Mr. Carl J. Schumann. Executives of the various departments discussed problems of particular interest to the salesmen, and factors which would help them make 1940 a "top" year for sales.

A conference of the Western sales representatives was held on October 23rd and 24th at the Hotel Stevens, Chicago, Illinois.

Nickel Alloy Developments

Mr. E. J. Hergenroether of the Detroit office of the Development and Research Division, The International Nickel Company, Inc., 67 Wall St., New York, N. Y., recently presented an illustrated talk before the Indianapolis chapter of the American Society of Metals. Nickel alloy developments in steel and miscellaneous alloys were discussed, particularly those developments relating to the automotive, aircraft, and machine tool industries.

Wheelco Appoints Representatives in South

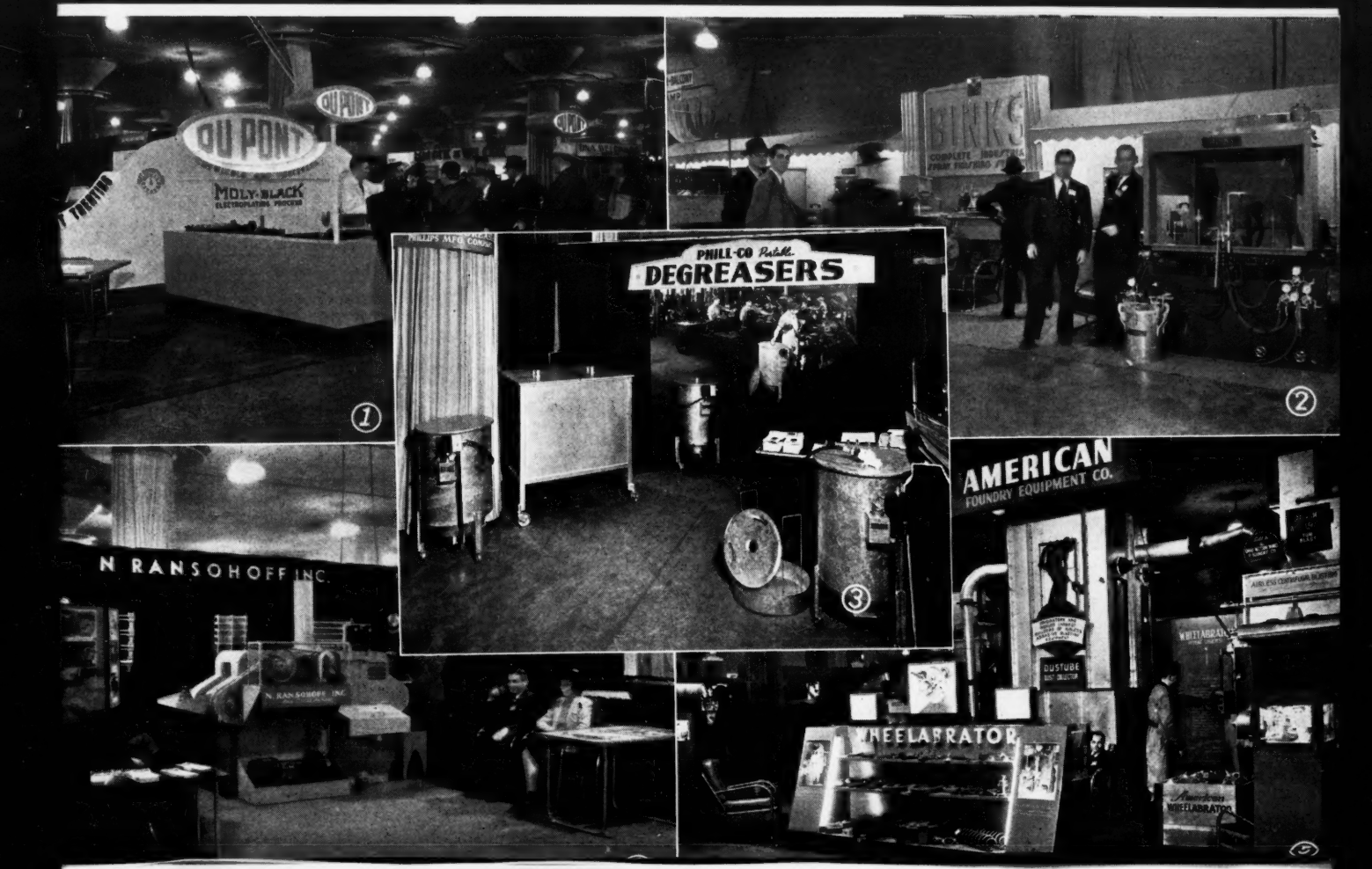
Wheelco Instruments Co., 1929 S. Halsted St., Chicago, Ill., recently made the announcement of the appointment of Industrial Equipment Co., 732 M & M Bldg., Houston, Texas, and Frank P. Fischer, 1608 Audubon St., New Orleans, La., as representatives for indicating and controlling instruments.

Production Machine Company Acquires Francis Reed Company

According to a recent announcement, Production Machine Company, Greenfield, Mass., has taken over the business, goodwill, merchandise, tools, and so on, of the Francis Reed Company, Worcester, Mass. This company is an old and well known manufacturer of sensitive drilling machines, manufacturing drills under the Reed and formerly the Barr trade names. The Francis Reed Company has brought out a line of plain, ball bearing, tight and loose pulley, and motor drive sensitive drilling machines, and this line will be supplemented by additions that will be made by Production Machine Company.

Sixth International Heating and Ventilating Exposition

Increased activity in the leasing of space by exhibitors is reported for the Sixth International Heating and Ventilating Exposition which is to be held at


DU PONT
MOLY-BLACK
ELECTROPLATING PROCESS
1
BINKS
2
PHILLIPS MFG. CORP.
PHILL-CO Portable
DEGREASERS
3
N. RANSOHOFF INC.
AMERICAN
FOUNDRY EQUIPMENT CO.
DUSTUBE
WHEELABRATOR
4

Lakeside Hall, Cleveland, Ohio, during the week of January 22 to 26, 1940. Less than 20 per cent of the total exhibit area is now available.

General stimulation felt by all industry during the past few months may be responsible. Inquiries are now being received from concerns who earlier had decided not to participate. Most of the exhibitors who have exhibited at previous Heating and Ventilating Expositions have engaged space for the 1940 event, and many new exhibitors have come in.

The Heating and Ventilating Exposition—the Air Conditioning Exposition—brings together, biennially, the leading manufacturers in this field. The exposition represents the only time and place where so great a variety of air conditioning equipment and accessories can be examined and compared. Heating, ventilating, and refrigerating engineers, technologists in every classification of industry, contractors, builders, building owners and operators, public utility executives, jobbers and dealers come to the Exposition to see what is new and to make their individual comparison of values and claims.

METAL SHOW EXHIBITS

Shown here are several glimpses of booths which were on exhibit at the National Metal Congress and Exposition held in Chicago, Ill., during the week of October 17th to 23rd.

No. 1 shows a view of the Du Pont booth in which plating was demonstrated with the new Du Pont Moly-Black Electroplating Process. No. 2 is a display of Binks equipment showing several of the newest finishing units manufactured by this firm in operation. No. 3 is a view of the Phillips Manufacturing Company booth in which portable degreasing units were exhibited.

No. 4 shows a view of the N. Ransohoff, Inc. booth. Charts and photos of actual installations were features of this booth. No. 5 is a display of Wheelabrator equipment manufactured by American Foundry Equipment Company.

H. M. Cherry Joins A. T. Wagner Company

According to an announcement made recently, Mr. H. M. Cherry, formerly a Detroit representative for the Hanson-Van Winkle-Munning Co., Matawan, N. J., has been appointed to represent the A. T. Wagner Co., Detroit, Mich.

Dayton AES Convention

After a lapse of 24 years, Dayton, Ohio, is again preparing to play host to the 1940 Convention of the American Electro-Platers Society. Being but a few miles from the centers of population and manufacturing of the country, Dayton offers itself as an ideal convention city.

Dayton is not only rich in historical interest as one of the pioneer cities of this section, but it is also rich in industrial importance. It was here that the inventions of the Cash Register, the Airplane, and the Self Starter for Automobiles were made. The wide distribution of these and many more products manufactured here have made the name of Dayton well known throughout the world.

The Dayton Branch of the American Electro-Platers Society has selected the Biltmore Hotel as this year's convention headquarters. This hotel is considered by the Supreme Officers of the Society, who recently visited here, as one of the finest ever to house the A.E.S. Convention. In this hotel there are ample accommodations at moderate prices and several large ballrooms in which the technical sessions will be held. For those who may not care to stay at the Biltmore during the convention, other hotels may be found within a radius of six blocks.

The Educational Committee has decided to limit the technical sessions to four papers each, or 24 for the entire convention. Preprints of the papers to be given the following day, will be distributed at the close of the evening sessions. These will afford the members an opportunity to study each paper so that those wishing to enter into the discussions at the finish of the lecture will be more familiar with the subject matter.

With the promises of papers from many noted authors, the Dayton Branch assures those who attend this convention, a program that will include every phase of electroplating from the raw stock to the finished article.

Finishes THAT AID IN APPEARANCE AND UTILITY

(Right)—This "rope retailer" consists of a strong, all metal, blue enamel finished, inverted V-shaped, double-faced display. In contrast with the blue background, the letters on the display panel are printed in yellow.

(Photo Courtesy Modern Packaging)

(Below) — An air-conditioned motor coach. Note how careful color selection and distribution adds streamlining and beauty to the contour of the body.

(Photo Courtesy The American Rolling Mill Co.)

Nickel and Nickel-Base Alloys. The edition of Bulletin T-13, "Nickel and Nickel-Base Alloys—Their Use in the Design of Corrosion-Resistant Machinery and Equipment," is now being issued by The International Nickel Company, Inc., Development & Research Div., 67 Wall St., New York, N. Y. The text of this edition has been enlarged and in many sections rewritten extensively. Additional tables and curves have been revised to include the latest available information.

The addition of Tables I and X to include data on the new alloys, Hastelloy B and Illium R, has been made. Tables XI and XVII are brought to date to record the corrosion rates of nickel and Monel after five-year corrosion and atmospheric tests. The curves of Figures 23 and 24 have been redrawn and extended.

A copy of the new edition of Bulletin T-13 will be sent free upon request.

"Proper Care and Maintenance of Portable Electric Tools." This is the title of a handbook which is now being issued by Black & Decker Mfg. Co., Towson, Md. There are 12 pages in this handbook describing helpful hints not only on care and maintenance, but also methods of proper grounding to protect the operator, currents, and so on. The proper sizes of extension cable and pointers on what to look for when a tool fails to operate are also included. The handbook is said to be a real pocket pal for the portable electric tool user.

A copy of this handbook will be sent free upon request.

Catalog of Chemical Books. A new, large catalog of technical books has just been issued by the Chemical Publishing Co., Inc., 148 Lafayette St., New York, N. Y. This catalog covers domestic and imported books on chemistry, physics, mathematics, medicine, metallurgy, machinery, engineering, biology, general science, business, manufacturing, and technical dictionaries.

A copy will be sent to anyone interested, upon receipt of stamps to cover postage.

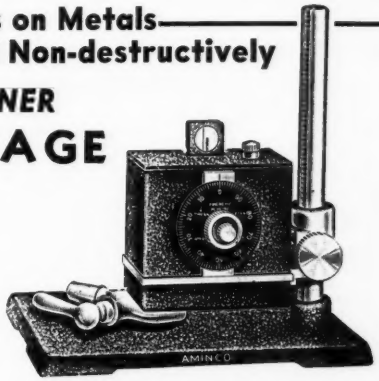
Mention PRODUCTS FINISHING when writing to advertisers.

Thickness of Coatings on Metals
Now Measured Rapidly and Non-destructively

AMINCO

AMINCO-BRENNER

MAGNE - GAGE



Measures Thickness of:

1. **Magnetic Coatings on Non-magnetic Base Metals.**
2. **Non-magnetic Coatings on Magnetic Base Metals.**
3. **Nickel Coatings on Iron or Steel.**

•

RAPID . . . permits testing of a large number of specimens at low cost, with little experience.

NON-DESTRUCTIVE . . . will not injure the coating or the base metal, thus effecting great savings.

UNIVERSAL . . . applicable to plane, convex or concave surfaces.

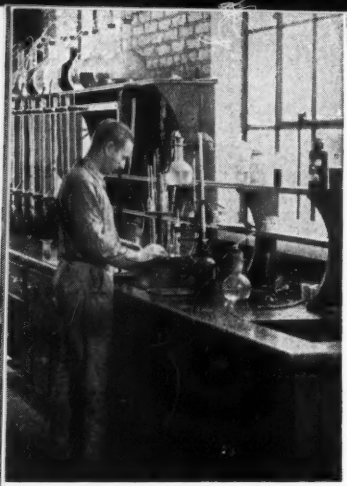
COMPACT . . . PORTABLE . . . weighs only 7½ lbs.

Ideal for Works Control or Acceptance Testing

•

Write for Bulletin PF2070

AMERICAN INSTRUMENT CO.
8010 GEORGIA AVENUE - SILVER SPRING, MARYLAND



THE Finishing FORUM

Disposable Paint Mixing Containers

By Willard Seeman

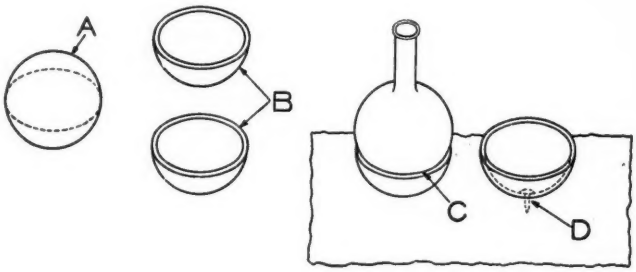
WHERE small quantities of organic finishing materials are mixed, and particularly in color matching, the trouble and cost of having to use clean containers for each new job is often appreciable. To use a new, clean can, even if it is the single friction fit top type, is quite expensive. If the mixing is done in a spray gun container there is time lost in cleaning, not to mention the cost of rags and thinner.

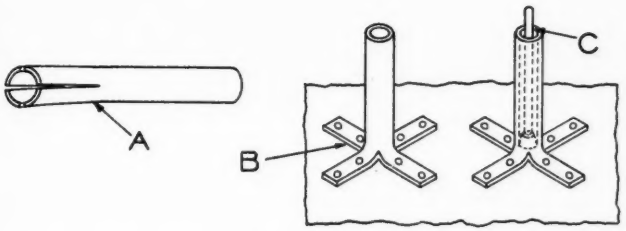
This problem is easily solved by using paper containers of the type made for beverages and foods. These containers, made in the shape of a cylinder or a drinking glass, may be purchased in a variety of sizes up to one quart. Because of their low cost they may be discarded after use, without the necessity for cleaning, and so on. Some of the containers are equipped with close fitting covers, and while they are not recommended for storing lacquers or enamels for long periods, in many cases they can be sealed and maintained for a number of days without the contents drying too much.

Simple Holding Devices for Laboratory Glassware

By A. H. Waychoff

THE sketches presented herewith show two simple holding devices for laboratory glassware. The one device which is designed for holding flasks, beakers, retorts, and so on





can be made from a hollow rubber ball. At A is shown the ball with a marking around the circumference showing where the ball should be split into two parts. B shows the two halves of the ball.

To use the split ball, one-half is fastened to a table or shelf by means of a small nail or tack as shown at D. C shows the manner in which a beaker can be placed in the rubber ball to protect it against tipping, spilling, and possible breaking. Balls of various sizes can be used to accommodate a variety of different size pieces of glassware.

A device for holding and protecting thermometers, hydrometers, pipettes, and so on against breakage can be made from scraps of rubber hose. One end of the hose should be cut in four segments of one and one-half inch lengths as shown at A. These segments should be spread apart and nailed to a table or board as shown at B. A rubber stopper can be placed on the bottom at the center so as to cushion the piece of glassware when it is dropped into the holder. C shows the manner in which the holder is used after complete assembly with a piece of glassware in place.

Portable Auxiliary Tank

By CHARLES H. WILLEY

IN the plating shop during rush periods when an extra amount of drying in sawdust of clean parts must be done, a portable auxiliary tank such as shown in the illustration herewith can be used. This tank is easy to fold and put away when not in use.

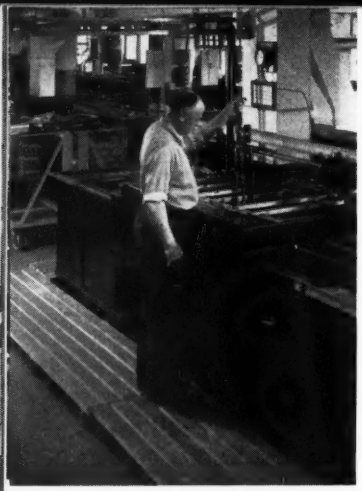
The support for the tank is made from four equal length pieces of wood which are nailed in pairs to form cross legs. Three bars of metal or wood of equal length can be used for the longitudinal support pieces. Two

Portable Auxiliary Tank

of these pieces are fastened to the ends of the cross members and the other piece to the center of the cross members.

A piece of heavy canvas is sewn around the two side pieces to form the tank. When it is desired to use this tank as an extra rinse tank, the canvas can be coated with a waterproofing material.

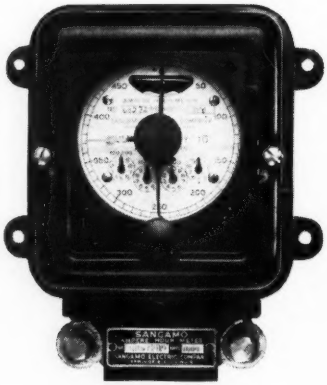
Mention PRODUCTS FINISHING when writing to advertisers.



New PLANT EQUIPMENT AND Materials

Sangamo Amperehour Meter

To enable more efficient plating solution and production control, Lasalco, Inc., 2822 LaSalle St., St. Louis, Mo., has placed on the market an amperehour meter to be known as the "Sangamo." The amperehour meter registers the number of amperes that have been used in terms of amperehours. The Sangamo Amperehour Meter can be installed in the same manner as the ordinary ammeter and is said to require no highly technical trained men for operation.



Sangamo Amperehour Meter

The Sangamo Amperehour Meter can be furnished in three types: to indicate the amperehours required for any particular operation; with totalizing dials to totalize amperehours over a long period of time; or with a combination of these features to indicate individual plating operations, and to totalize long plating runs.

Amperehour meters of over 100 amperes capacity are supplied with external shunts. These shunts should be connected between the tank rheostat and the tank, if convenient, so that the possibility of error is minimized. Meters supplied with shunts are furnished with five foot shunt leads. Longer shunt leads are available, depending upon the the length of lead desired.

Continuous Unit for Cleaning Strip Steel

The Electrochemical Processes Division of Blaw-Knox Company, 2042 Farmers Bank Bldg., Pittsburgh, Pa., has announced the development of a continuous unit for strip steel before annealing. The cleaning principle is said to be electrochemical in nature and to provide for a faster and cleaner chemical action with an appreciably lower consumption of current.

An outstanding feature of the design of the continuous unit for cleaning strip steel is the short length of cleaning line, being only 95 ft. from center to center of payout and windup reels.

Despite the economy in space, the unit is designed to clean 1,500 ft. of strip per minute. A cold mill type of electrical strip tension control for the full length of the line has the objective

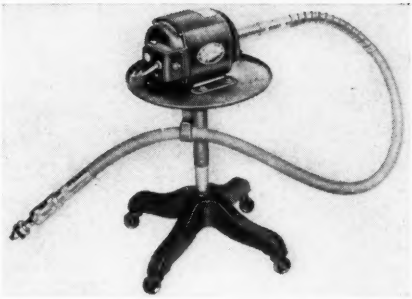
of eliminating loss or delays due to folded or damaged strip. There is fully automatic control of the solution and temperature.

Stow Junior Flexible-Shaft Tools

A new line of flexible-shaft tools for grinding, polishing, buffing, rubbing, wire brushing, sanding, and so on, to be known as the "Stow Junior," has been announced by the Stow Manufacturing Co., Inc., Binghamton, N. Y. This line has been designed to afford companion units to the long-established Stow Heavy-Duty Tools.

The first of the Stow Juniors to be placed on the market is the pedestal type. This unit incorporates motor, extension cord and plug, and a flexible shaft and clamp spindle. The power connection can be made into any electric light socket.

The pedestal type Stow unit is mounted on a four-leg metal base which is equipped with ball bearing casters. The unit is sturdy and can be easily moved about. The pedestal is adjustable in height and maintains a low center of gravity with consequent good balance, even in the extended position. The pedestal is also equipped with a convenient tool tray.



Pedestal Type Stow Junior Flexible-Shaft Machine

The Pedestal Type Stow Junior is available with motors of ¼, ⅓, or ½ h.p., with two choices of speeds, either 1,725 or 3,450 r.p.m. The ¼ h.p. tool has a ⅜ in. flexible shaft, 5 ft. in

Workmen Prefer

MILLER ANODE GLOVES

★ Satisfy your workmen. Supply them with Miller Anode Gloves. Hands don't tire as quickly in these highly flexible gloves.

These quality gloves will save you money, too. That's because they are produced by the Anode process which retains all of rubber's original strength and gives it unusual age resistance.

The Miller line is complete, offering a selection of acid and industrial gloves with wrist-length rolled cuffs or 5″ and 9″ gauntlets in a wide range of thicknesses. Select the ones best suited to your needs and put them to the test. You will discover, as have hundreds of other users, that Miller Anode Gloves are the only ones you can afford to use regardless of price.

Call your local jobber now. If he cannot supply you, don't accept substitutes, just write

MILLER RUBBER CO., Inc., Akron, O.

"Engineers in Rubber"

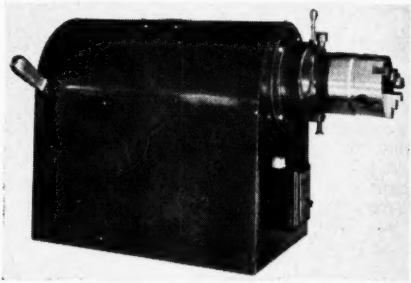
length. Its maximum wheel capacity is 4 in. x 1 in. and maximum drilling capacity is ¼ inch. The ⅓ and ½ h.p. tools have a ½ in. x 6 ft. shaft, a maximum wheel capacity of 6 in. x 1 in., and a maximum drilling capacity of ⅜ inch.

Ideal Variable Speed Lathe

A variable speed lathe which has been designated as the VA1B Ideal has been placed on the market by Schauer Machine Co., 2060 Reading Rd., Cincinnati, Ohio. This lathe is said to provide a polishing heat with infinite variable spindle speeds of 75 r.p.m. to as high as 6,350 r.p.m. The range of variation is said to be approximately 6.8 to 1 with a single speed motor, and 14 to 1 using a two speed motor.

The VA1B Ideal Variable Speed Lathe is of simple and rugged construction, totally enclosed and equipped with a readily removable motor of standard Nema frame size to drive the spindle. Variation in spindle speeds is obtained by the use of a variable pitch pulley between the motor and the spindle with standard length, easily replaceable V belts.

Standard equipment includes an automatic braking system for quickly stopping the spindle and a three-jaw universal chuck for holding the work. A one-inch clear hole is provided through the spindle. The speed of the spindle may be changed to any speed from maximum to minimum, according to the type of work being done, merely by the simple movement of a conveniently located hand lever. It is unnecessary to stop the lathe while speed changes are being made. Facilities for adjusting the belt tension to compensate for belt stretch and wear are provided in an easily accessible adjustable bushing located on the speed control lever.



Ideal Variable Speed Lathe

The VA1B Ideal Variable Speed Lathe built for bench mounting has an overall length of approximately 26½ in., 11⅛ in. width, and 16⅞ in. high. A thermal switch and overload relay is standard electrical equipment on all lathes.

Complete engineering service for adapting the Type VA1B Ideal Speed Lathe to the individual production needs is said to be available.

THE ADIRONDACKS GORE MOUNTAIN CRYSTAL GARNET ORE

ABRASIVE GARNET

World's Standard for Over 60 Years
FOR
Abrasive Paper and Cloth
Grinding Wheels
Sand Blast
Lithographing
Non-Skid Surfaces
Wearing Surfaces
Ornamental Purposes
Minus 300 Mesh For Polishing

BARTON MINES CORPORATION
NORTH CREEK, WARREN COUNTY, N.Y.

Subox No. 6 Green Paint

A ready-mixed, single coat, rust-inhibitive green paint for metal to be known as "Subox No. 6 Green" is now being marketed by Subox, Inc., 348 River Rd., North Arlington, New Jersey.

In maintenance or new construction work, where single coat painting is desired on furnaces, railings, fire escapes, tanks, or ornamental iron work, Subox No. 6 Green can be applied with a minimum of cleaning operations or expense. This material is based on the colloidal and amorphous sub-oxide of lead pigments blended with C.P. Chromium Oxide green.

After application by brush or spray, the paint film undergoes progressive chemical reactions which retard corrosion effectively, and a firm, hard film is developed in a pleasing dark green color. Being both acid and alkali resistant, Subox No. 6 Green can also be used in industrial neighborhoods without fading, chipping, cracking, or blistering.

Each gallon is said to cover approximately 850 sq. ft. of normal metal surface.

DeVilbiss Type NCK Spray Painting Unit

A direct-drive spray painting unit designed for use where medium and light-duty spray equipment is required, to be known as the "Type NCK," has been placed on the market by The DeVilbiss Company, 300 Phillips Ave., Toledo, Ohio. This electric spray painting unit is operated by a 1/3 h.p. motor.

The compressor is of the piston type and is directly connected to the motor and has a displacement of 4.58 c.f.m. At this displacement, the DeVilbiss Type GC spray gun is held at 38½ lbs. pressure.

DeVilbiss Type NCK Spray Painting Unit

The compressor is a single cylinder, ball bearing type with two inch bore and one and one-half inch stroke and is mounted on a rubber footed metal base. The maximum working pressure is 40 pounds.

A fan-type counter-balanced flywheel is said to reduce vibration to a mini-

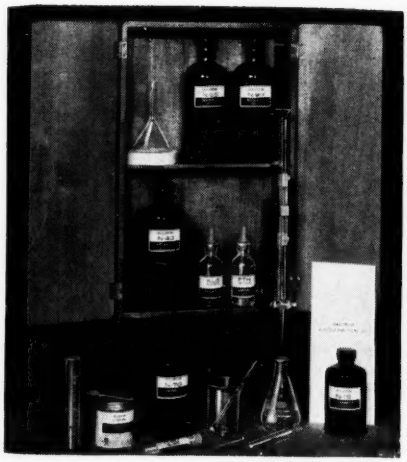
COSTS GO DOWN when
you grind down welds with
SKILSAW DISC SANDERS
They will save you much time and labor on your toughest weld grinding and cleaning work and leave a smooth, even surface. 3 MODELS for use with grinding wheels, wire brushes, polishing pads, etc. on flat, concave and convex surfaces of metal, wood, stone, marble, tile and composition.
• Sold by leading distributors •
SKILSAW, INC., 4743 WINNEMAC AVE., CHICAGO
36 E. 22nd St., New York; 182 Main St., Buffalo; 52 Brookline Ave., Boston; 15 S. 21st St., Philadelphia; 2124 Main St., Dallas; 918 Union St., New Orleans; 1253 S. Flower St., Los Angeles; 2065 Webster St., Oakland; 29 North Ave., N. W., Atlanta. Canadian Branch: 85 Deloraine Ave., Toronto.

mum and assure proper cooling. A finned air chamber relieves pulsation and serves as an oil and moisture separator. The unit is provided with a safety valve, drain valve, and connection for hose. A 12-ft. length of electric cord with attachment plug and switch at motor contributed to convenient operation from a light socket.

The DeVilbiss Type NCK Spray Painting Unit is available with three separate assemblies of spray equipment.

Kocour Analytical Set

The Kocour Analytical Set for determining the metal content, free cyanide and carbonate of silver electroplating solutions is now being marketed by Kocour Co., 4730 S. Christiana Ave., Chicago, Ill. The set consists of a well-made wall cabinet fitted with hardware to hold the necessary glassware during use and storage. The set is said to be extremely easy to operate. Readings obtained from the set are the results sought and there are no involved calculations required. All readings are in ounces per gallon of solution of the various ingredients. The directions for the set include a method of alternating solutions should they be out of balance.



Kocour Analytical Set

The set reads in both sodium and potassium cyanide, and sodium and potassium carbonate.

The accuracy of the set, according to the manufacturer, is as follows: silver to 1/10 oz. per gallon, free cyanide to 1/20 oz. per gallon, and carbonate to ¼ oz. per gallon.

R-700

An unusual Rust Inhibitive.
Dries with lacquer speed.
Very flexible baking schedule.
Resists salt spray remarkably.
Very light in color.
Ideal vehicle for bronze powders and pastes.
Suggested wherever RUST is a production problem.
Remarkably adherent as primer under baked finishes.
Variations for special requirements available.
Our pamphlet will be gladly sent on request.

The Varnish Products Co.
5208 HARVARD AVENUE
CLEVELAND, OHIO

"Buffalo" Type L Breezo Fan

For use where a propeller-type fan is necessary but where the motor must be outside of the air stream, the Type L Breezo Fan shown here has been brought out by Buffalo Forge Company, 388 Broadway, Buffalo, N. Y. The fan is built of standard, readily interchangeable parts, so that the unit may easily be arranged to fit into any system. The fan is especially designed for exhausting spray from paint spray booths, chemical plants, and other places where an excess of moisture, dust, heat, or fumes is to be removed.

The motor, V-belt, pulleys, and one bearing of the fan are entirely outside the path of the air. The bearing at the fan end of the shaft, which is in the air chamber, is of bronze, enclosed wool-packed, requiring oiling about once in two thousands hours of use. When desired, enclosed ball bearings packed in grease can be furnished. Housings are so designed that the air inlet may

be at the top, bottom, or either side of the unit and may be changed from one side to the other on the job if necessary. The fan is made in sizes from 12 to 36-in., to operate at speeds of 1,725 r.p.m. for the 12-in. down to 600 r.p.m. for the 36-in. and to deliver from 1,080 to 10,800 cu. ft. of air per minute.

"Buffalo" Type L Breezo Fan

Milburn Type KSC Spray Gun

A spray gun to be known as the "Type KSC" has been developed and is now being marketed by Alexander Milburn Company, 1436 W. Baltimore St., Baltimore, Md. This spray gun is specially designed for maintenance work where it is desired to remove grease or oil from metal.

The Type KSC Spray Gun is equipped with an unusually long nozzle, which is of particular advantage in reaching into ordinarily inaccessible places. Kerosene, or any other cleaning solvent, may be used with this type of gun.

Air enters the gun through the handle, and siphons the fluid from the cup. The delivery is controlled by a simple adjustment of a fluted nozzle. A knurled nut locks the fluted nozzle in spraying position. Any desired volume may be obtained, form an almost solid stream to a finely atomized spray.

The Milburn Type KSC Spray Gun may also be used for dusting or drying purposes. The adjustment for this type of work can be made by merely shutting off the fluid inlet. The gun is said

Now..PLATING ON ALUMINUM

commercially practical and successful

Beautify your aluminum products — increase their wear resistance — in numerous ways take advantage of the lightness and strength of aluminum without sacrificing a lustrous or decorative finish of your product.

Increase the uses of your aluminum products. Acquaint yourself with our plating-on-aluminum service—it's nationwide. Write us for information.

FEATURES:

- **Aluminum can be plated with any of the common metals.**
- **Aluminum can be plated in any of its forms — sheets, die castings, sand castings, extruded pieces or alloys.**
- **Nickel plated aluminum can be soldered with ordinary solder or flux.**
- **Plating prevents corrosion of aluminum.**
- **Aluminum can be bent or distorted without peeling of the deposit.**
- **Plated surfaces adhere firmly to aluminum.**

PHILIP SIEVERING, INC.
195 LAFAYETTE STREET NEW YORK, N. Y.

to be simplicity itself, inasmuch as it has a die cast body and stamped steel reservoir. It is designed to be easily

Milburn Type KSC Spray Gun

held and operated with one hand. The trigger of the gun is conveniently located and requires only slight pressure to release the air or fluid.

Tops Finishing Material

V. J. Dolan & Company, Inc., 1828 N. Laramie Ave., Chicago, Ill., has placed on the market a one-coat finishing material for metal furniture to be known as "Tops." This finishing material is said to give an equivalent of two coats of lacquer in a single application.

Tops air dries like lacquer and is said to require no heating or baking or any special equipment. The finish flows and rubs easily to a brilliant lustre. Resistance to alcohol and water are said to be outstanding features of this finishing material.

"INDIAN BRAND"
EMERY
absolutely uniform

YOU GET—

Absolute uniformity.
Highest quality.
Greater capillarity.
Longer wear.
Prompt delivery.

Write for trial lot.

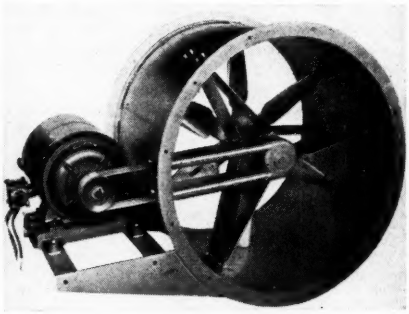
"INDIAN BRAND" TURKISH AND NAXOS EMERY
INDIAN BRAND
"HECCO BRAND" AMERICAN EMERY

HAMILTON
EMERY & CORUNDUM CO.
CHESTER • MASS.

South Bend Fan Unit

South Bend Air Products, Inc., South Bend, Ind., announces an entirely new fan unit, primarily designed for use in duct systems and claiming a number of advantages, especially when explosive gases are to be handled.

The fan is available in both single fan and tandem fan types, and for static pressures up to 3 in. Single fan unit capacities range from 1,600 to 26,000 c.f.m., with tandem units from 1,600 to 30,000 c.f.m. These units are easily installed in any duct line without fitting other than for a simple flange on the end of the duct.



Sound Bend Fan Unit for Duct Line Use

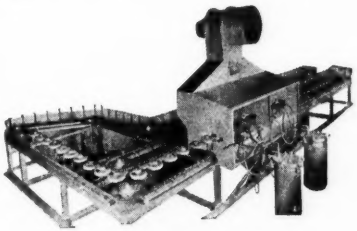
Blades are drop forged aluminum alloy, non-sparking, and safe in explosive atmospheres. Motor support is integral with the fan unit. The belt and all working parts are completely enclosed for protection, yet easily accessible. Adjustable belt tension is provided. When used to handle acids, the unit can be furnished completely covered with Heresite. A completely self-contained unit is available in practically any size.

Paasche Automatic Airpainting Unit

An "L" shaped Paasche conveyor unit for airpainting motor ends, for use in connection with a continuous type high

temperature drying oven has been placed on the market by Paasche Airbrush Co., 1910 Diversey Parkway, Chicago, Ill. This unit is equipped with dual aircoating stations for applying both primer and air finishing coats.

The automatic airpainting unit is equipped with 158 rotating spindles de-



Paasche Automatic Airpainting Unit

signed so that the air brushes coat only when the loaded spindles enter the ventilating booth. The production is 24 motro ends per minute or 11,520 per eight-hour day when the conveyor is operated at an average speed of 18 lineal feet per minute.

Firmex Sealing Compound

A sealing compound which is said to be permanently waterproof, plastic, and weatherproof to be known as "Firmex" is being marketed by Firmex Plastic Company, 104 Nineteenth St., Brooklyn, N. Y. Firmex Sealing Compound can be used as a general sealing and caulking compound. According to the manufacturer, it is a waterproof permanent plastic for use under all service conditions. It will not shrink or crack and is non-sagging and non-crumbling. This material is unaffected by vibration, heat, cold, or severe weather conditions.

Firmex Sealing Compound is available ready for use and can be applied by hand, caulking gun, or putty knife.

Ransohoff Inter-Process Washing Machine

An inter-process machine designed for washing, drying, and conveying parts from one operation to another has been placed on the market by N. Ransohoff, Inc., West 71st St. at Millcreek, Carthage, Cincinnati, Ohio. This machine is said to receive two different kinds of parts on the same conveyor and keeps them separated as it spray washes and

Did You Know That---

—Jewelry can be plated efficiently by production methods? See page 10.

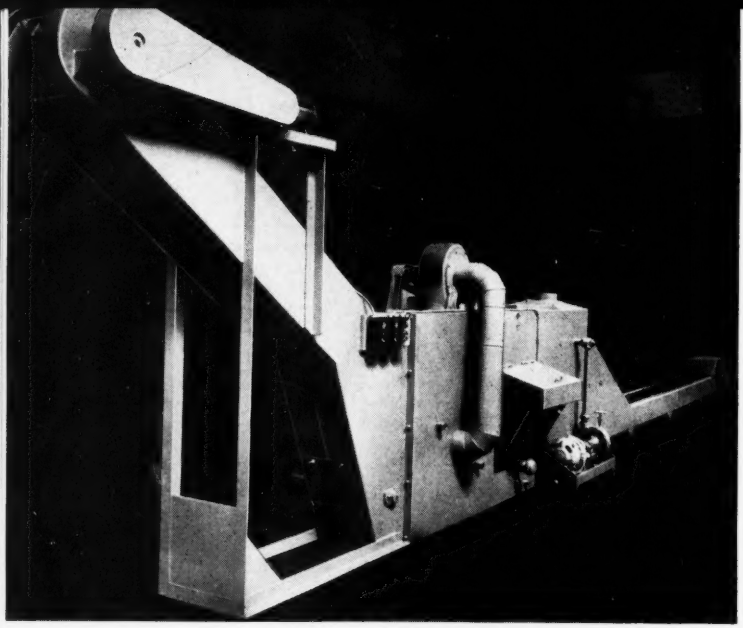
—Samples of two new finishing materials will be sent to you free? See page 15.

—Castings are machined after finishes have been applied to them? See page 26.

—A catalog showing many benefits of the Parker process is available? See page 35.

—A formula for a standard soap solution to be used in checking the efficiency of a water softener will be sent free on request. See page 36.

—Satisfactory finishes on magnesium base alloys are possible without departing from normal practice? See page 46.



Ransohoff Inter-Process Washing Machine

air dries them and elevates and drops each part into the proper hopper, clean and ready for the next operation.

The conveyor of the unit is of the parallel roller chain type connected by bars on the pitch line with flexible wire mesh belt fastened to the bars. Articulated guide rail plates on the side and in the center hold the two kinds of parts separate as they are carried through the machine.

During the washing operation, the parts are first carried in a hot spray chamber and then are dried by means of a steam heated air blast which is directed against both the top and the bottom.

The Ransohoff Inter-Process Washing Machine is a single unit. All equipment is mounted and aligned during assembly so that in the installation it is only necessary to make steam, water, drain, and electrical connections. The conveyor of the unit is equipped with a friction drive.

Repeat Cycle Timer

A repeat cycle timer especially designed for use on A.C. circuits has been placed on the market by The R. W. Cramer Company, Inc., Centerbrook, Conn. This unit is designed to alternately close and open one or two circuits continuously at any preset operating interval, and close or open a single circuit after any preset operating interval and stop, ready to repeat its cycle of operation upon reclosure of a starting switch.

The Cramer Repeat Cycle Timer has a wide variety of uses. Some of these include the automatic alternate operation of two pumps in a dual pumping installation, to uniformly reverse the gas flow in baking and firing furnaces, and to automatically control the duration of operation of electrically oper-

GOT A DEGREASING PROBLEM?

We can build a "D'OILER" that will handle your degreasing problem economically.

WRITE FOR FURTHER DETAILS

Use D'OILENE "A" — The Perfect Degreasing Solvent

MECHANICAL PROCESS CORP.

SOUTH ORANGE • NEW JERSEY

SPECIALISTS IN THE USE AND HANDLING OF CHLORINATED SOLVENTS

ated processes. The timer consists essentially of a reversible synchronous motor with enclosed gear train, an adjustable time dial, a switch unit all mounted on a common base and enclosed in a metal housing.

The synchronous motor is a precision built 2.8 watt slow speed, 450 r.p.m.,

Repeat Cycle Timer

self-starting, reversible type with enclosed gear train operating in oil. The switch unit is a quick make quick break self-locking type with silver butt to butt contacts rated to carry a ½ h.p. motor load.

The housing is an attractive metal die casting and is both dust proof and moisture proof. It is provided with a glass window for inspection purposes, a hasp for padlocking, and four conduit knockouts for either ½ in. or ¾ in. conduit.

Rome Model "MOS" Polishing and Buffing Lathe

A polishing and buffing lathe to be known as the Model "MOS" has been

NEW! BETTER!

Plating Rack Coating

Lasts Longer, Cuts Costs

UNICHROME* RACK COATING-W

THE RESULT of extensive research by United Chromium, Inc., Unichrome Rack Coating-W provides a *combination* of important advantages found in no other rack coating material. Already in active use in many plating shops, it has produced amazingly fine results.

MANY ADVANTAGES

1. Not affected by boiling cleaners or plating solutions.
2. Does not blister or crack.
3. Tough—withstands wear and tear of normal handling.
4. Contains no ingredient harmful to any plating solution.
5. Cuts costs—by greatly reducing frequency of recoatings.
6. Easy to apply—by "dip and force-dry" method.
7. White in color—easy to see how completely the rack is covered.
8. Any part of rack can be recoated without necessity of recoating entire rack.

PROVED ECONOMY: Companies who have thoroughly tested Unichrome Rack Coating-W are without exception enthusiastic about it. Reports show that some racks coated with this material have gone through over 1,000 plating cycles without any insulation breakdown.

Write for Bulletin No. 31
containing complete information

Platers without rack dipping and drying facilities may have their racks coated with Unichrome Rack Coating-W by making arrangements with Chromium Corporation of America, 4645 West Chicago Avenue, Chicago, Illinois, or Lea Manufacturing Company, Waterbury, Conn.

UNITED CHROMIUM
INCORPORATED

51 East 42nd Street
New York, N.Y.

2751 E. Jefferson Ave.
Detroit, Mich.
Waterbury, Conn.

*Trade Mark
Reg. U.S. Pat. Off.

placed on the market by Rome Machinery Sales & Engineering Co., 627 Webster St., Rome, N. Y. This machine is modernly styled and has been designed to provide convenient operation with a minimum amount of maintenance.

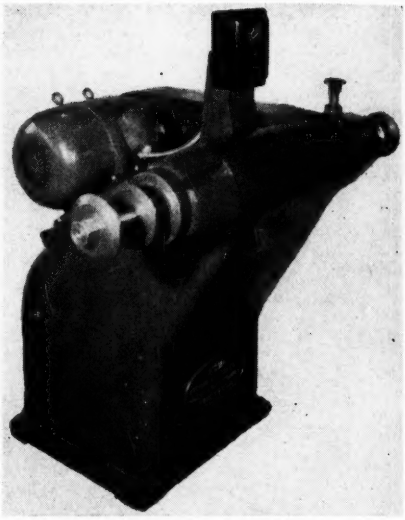
The base of the Model MOS is arranged with an overhanging wheel spindle and is cast of heavy section grey iron. The SAE alloy steel wheel spindle is ground to size and is accurately balanced. The spindle ends are machined with flat top threads and fitted with bronze spindle nuts. To permit the assembly of taper point attachments, each spindle end is tapped and counterbored.

The wheel spindle is mounted on high capacity, precision ball bearings with enclosures that permit lubrication with oil or with grease by the cavitation principle. Grease lubricated bearings on this machine are said to operate for periods extending over six months without attention. To facilitate mounting and removal of wheels, a plunger-actuated spindle lock engages a four-station member which positively anchors to the wheel spindle.

Multi-V-belt spindle drive on the unit is entirely enclosed by a cast guard which includes a removable cover plate for belt inspection. To provide long belt life and proper operation tension under all load conditions, the continuous-duty, totally-enclosed, fan-cooled, ball bearing motor is mounted on an automatic tension controlled base. The motor starting switch is bracket mounted and accessible to operators and in a position readily connected to service lines. The motor and starter are wired electrically.

The Model MOS Lathe is available in horsepower ratings, up to and including 10 h.p. The spindle diameter of wheels and spindle r.p.m. are available to customers' specifications.

A spindle nut wrench is included as standard equipment. Various accessories taper screw points, variable speed spindle drive, tool shelf, start-stop-brake lever control for the spindle, dust hoods with mounting brackets, and composition applicators can be supplied as optional equipment.



Rome Model MOS Polishing and Buffing Lathe equipped with a 5 h.p. motor

Are you certain that your product finishing is the best possible?

ROBERTS rouges and compounds are always dependably uniform and add the refinement which proclaims the superior product.

Many leading industries have proved that the ROBERTS way is the sure path to better finishes.

Let us send you samples for a convincing demonstration that ROBERTS products can also improve your work at less cost.

THE ROBERTS ROUGE CO.

Factory
247 Connecticut Ave., Bridgeport, Conn.
Manufacturers of: GOLD, SILVER PLATE AND STERLING ROUGES; STAINLESS STEEL, CHROME AND CROCUS COMPOUNDS

Ford Viscosimeter

A viscosity cup designated as the "Ford Type" for determining the consistency of paints, lacquers, and varnishes has been placed on the market by Scientific Instrument Company, 531 W. Larned St., Detroit, Mich. The test

consists of timing the flow of material through a standardized orifice. The average of two or more tests taken at exactly the same temperature is taken as a measure of the consistency.

The Ford Viscosimeter consists of a heavy polished metal cup with a conical bottom into which is screwed a standardized orifice, calibrated at 80 deg. F. and true to specifications within 0.05 per cent. The cup is provided with an overflow well at the top and the orifice is protected by a cylindrical jacket projecting below it.

In use, the cup is screwed into a ring bracket which is fastened to a stand. The orifice is closed by the index finger and the cup is filled to overflowing with the material to be tested.

The material in the cup is leveled off by passing a metal scraper horizontally across the top of the cup. The liquid in the cup should be free from air bubbles, thus assuring that it is level full before a test is made. The index finger is then removed simultaneously with the starting of a stopwatch and the time noted at the first evidence of a break in the stream through the orifice.

Pollard Extra-Heavy Steel Bench

In answer to numerous requests for a steel bench with a heavier top than the standard ⅛-in. steep top, Pollard Bros. Mfg. Co., 5515 Northwest Highway, Chicago, Ill., has designed and placed on the market the extra-heavy steel top bench shown in the illustration. The top is made of ⅜-in. steel plate which is bolted to heavy-duty bench legs.

Pollard Extra-Heavy Steel Bench

The Pollard Extra-Heavy Steel Bench is available in two standard widths of 24 and 30 in., and in lengths of 3, 4. 5 and 6 ft. However, in the case of

How to **PREVENT ACCIDENTS HANDLING ACIDS and CHEMICALS!**

Risk of serious accidents is always present where men work with acids, chemicals and caustics. The dangers can be greatly reduced by the use of the specialized Pulmosan protective equipment shown below. Each is carefully designed for the purpose intended and affords highest safety.

Respirators
Safety Goggles
Acid Aprons
Sleeves, Gloves
Acid Hoods
Carboy Truck
Carboy Tilter
Carboy Safety Siphon
Skin Protectives
Acid Pails and Dippers

WRITE FOR NEW SAFETY FOLDER

entitled "Safe Handling of Acids and Chemicals," which illustrates and describes each item of protection.

PULMOSAN SAFETY EQUIPMENT CORP.

Dept. PF. 176 Johnson St., Brooklyn, N. Y.

the 6-ft. length, due to the heavy requirements of this bench, the bench is equipped with three heavy-duty legs. The accessories provided with the extra-heavy steel bench, such as back plates, stringers, and shelves, are made from heavy material. As shown in the illustration, each size bench is equipped with steel drawers.

Pulmosan T. P. C. Safety Siphon

A simple and efficient device for discharging the contents of carboys, to be known as the "T. P. C. Safety Siphon," has been placed on the market by Pulmosan Safety Equipment Corp., 170 Johnson St., Brooklyn, New York.

The T. P. C. Safety Siphon consists of a special acid-resistant tube, to which is attached a priming bulb, visual priming chamber, special composition flexible hose, and a flow control valve. After the siphon is inserted into the container, the flow valve is closed and the priming bulb flexed until liquid is visible in the chamber. By adjusting the control valve, a regulated flow of liquid from a trickle to six gallons per minute may be delivered. The flow of the liquid is automatic.

Only one man is required to operate the T. P. C. Safety Siphon. The unit works on a vacuum principle and eliminates the pressure method. The danger of fumes, burns, spillings, and splashings is reduced to a minimum. The entire contents of a container can be completely discharged without tilting the container. Models of the T. P. C. Safety Siphon are available for practically every type of liquid and container.

Pulmosan T. P. C. Safety Siphon

"Fence-Bond" Aluminum Paint

A ready-mixed aluminum paint, especially formulated for painting metal surfaces that are exposed to the weather, without first going to the trouble of removing the rust, has been developed by The Skybryte Company, Cleveland, Ohio. Originally intended for painting rusted chain link fence, the paint is known as "Fence-Bond."

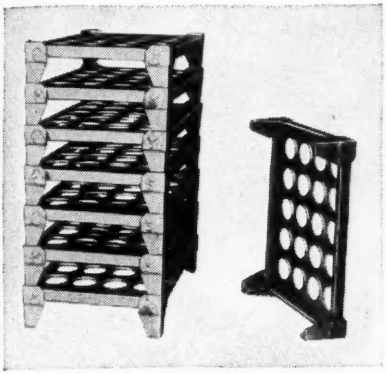
The base oils are of the penetrating type which creep into all joints and contact points, sealing the rust against further corrosive action. Fence-Bond is said to dry from the outside, retaining a firm elasticity which is able to withstand the movement of the joints without chipping. The paint may be applied either by brush or spray gun.

RUST-I-CIDE "50"
Cleans, etches, and prepares metal for a perfect finishing job.
It can help your product.
RUSTICIDE PRODUCTS CO.
3125 Perkins Ave. • Cleveland, Ohio

Oriental Rouge is the ideal rouge for obtaining a mirror-like finish on stainless steel, silver, gold and all other metals. Write for details.
Oriental Rouge Co., Inc.
Established 1901
66 Pine St. • Bridgeport, Conn.

Equipment for Handling Accurately Finished Parts

A steel tote tray to hold finished or semi-finished machined parts without scratching or marring has been placed on the market by Stackbin Corporation,



Equipment for handling accurately finished parts

92 Troy St., Providence, R. I. Of heavy steel construction, with all edges rounded to eliminate the possibility of scratching, these tote trays offer an efficient solution to the problem of handling accurately machined parts whose accurate finish might be marred by contact with each other.

Finished parts can be taken from machines, stored in these stacking trays and carried in them between operations and from one department to another. Thus, the new trays save many handling operations and completely eliminate all danger of damage from contact with each other.

Because they are made entirely of steel they can be used for dipping and draining parts, saving time and protecting parts against damage during handling.

The trays are made to stack, thus eliminating the danger of their contents touching each other or of tipping over. Available with either pegs or holes, as required, they can be furnished with removable wooden boards if desired.

Phenolex

Silver-like aluminum coatings to be known as "Phenolex" have been placed on the market by Claronex Products, Inc., 237 India St., Brooklyn, N. Y. These coatings are said to be extremely elastic and will contract and expand with metal structures and atmospheric changes.

Phenolex coatings may be brushed or sprayed. The coating which is obtained is similar to silver in color. The coat-

"MAGIC" TACK RAGS
IMPROVE YOUR FINISH 100%

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

Wm. A. Juergens Co.
4036-40 Lagrange Street,
Toledo, Ohio, U. S. A.
If your dealer does not carry Magic Tack Rags, write us for sample.

STEELSHINE ROUGES for STAINLESS STEEL
Non-Scratching — free of ferric oxides

No. 7 Fast sharp cut
No. 14 Medium dry—fast cut—good color.
No. 190 Highest color—medium cut.
Special grades developed to meet your requirements.
Send for YOUR free sample TODAY.

E. REED BURNS MFG. CORP.
45 WITHERS ST. BROOKLYN, N. Y.

ings are said to resist vapors and fumes of strong corrosive agents such as dilute acids, alkalies, salt water brines, atmospheric changes, and so on. The coatings will not crack or peel.

Approximately 500 to 700 sq. ft. to the gallon on new or old painted smooth surfaces are obtainable. Phenolex Silver-Like Aluminum Coatings are available in one and five gallon double compartment kits. These coatings are also available in bulk.

Corronite

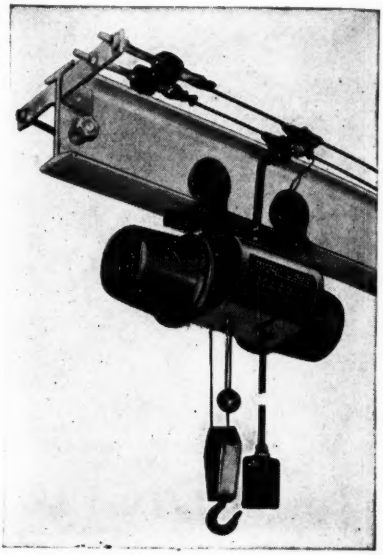
A pore-free metallic coating to be known as "Corronite" has been placed on the market by Standard Steel Spring Company, Coraopolis, Pa. This coating is said to provide corrosion resistance and to compare favorably in cost with present commercial coatings.

Corronite is designed specifically for applications on tonnage steel.

Wright Speedway Electric Hoist

The Speedway, a light weight low cost wire rope electric hoist, has been added to the line of material handling equipment made by the Wright Manufacturing Division of the American Chain & Cable Company, Inc., York, Pa. Hoisting capacities range from 250 to 750 lbs. and hoisting speeds from 15 to 43 ft. per minute.

The Wright Speedway Electric Hoist standard construction includes fully enclosed ball bearing motor, anti-friction bearings, cut alloy steel spur gears, multiple disc solenoid brake, push button control, preformed hoisting cable, and many other features which make it suitable for production service.



Wright Speedway Electric Hoist

The hoist is made in three types for lug suspension, hook suspension, or for mounting on a trolley.

Sterling Portable Electric Sander

Sterling Products Company, 2457 Woodward Ave., Detroit, Mich., has recently placed on the market an electric sander to be known as the "Sterling Gyro." This sander has a self-contained,

Lupomatic

Here is a *completely automatic* process for finishing all metals to a high grade lustre *at a saving of from 60% to 92%.*

Let us demonstrate *this money saving process to you gratis.*

Lupomatic Tumbling Mach. Co., Inc.
4511 Bullard Ave. New York, N. Y.

Every BUFF Made to Your Order
Deliveries on Schedule
MIDWEST BUFFS
USE MIDWEST
E. 79th ST. & PLATT AVE. CLEVELAND OHIO

gear-driven electric motor that can be plugged into any socket. A flexible sanding pad operates in a movement which closely simulates the hand sanding motion of the skilled craftsman.

Sterling Portable Electric Sander

The Gyro Electric Sander operates at 4,000 r.p.m. Abrasive paper can be attached to the sanding pad and held in place by a special holder. One-fourth of a standard size 9 x 11 in. sheet is required to cover the sanding pad. Any type or make of abrasive paper may be used. The Gyro Electric Sander can also be used for rubbing and polishing, in which case cloths can be attached in the same manner as the sandpaper.

The Gyro sander is sturdily constructed and weighs 3½ pounds. One hand is all that is required to guide the sanding heat over the work. The Gyro sander can be used in production factories as well as jobbing shops.

Felt Sample File and Chart

A felt sample file and chart is now being distributed by the Booth Felt Company, 434 19th St., Brooklyn, N. Y. Actual felt samples are bound into a standard 8½ x 11 in. chart file. The felt swatches are classified according to S.A.E. specifications and the 14 samples of felt types presented are chosen to cover virtually all commonly-known felt applications.

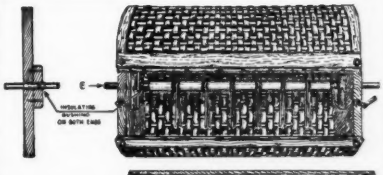
The chart lists a wide variety of applications for each type of felt shown so that by quick reference to chart and samples, the felt user's selection of the correct felt type for almost any purpose is greatly simplified.

Those who utilize felts or mechanical felt parts, or who are considering their possible use, may obtain this valuable felt chart-and-sample file by writing to the Booth Felt Company.

Mallsander

The Mall Tool Company, 7740 S. Chicago Ave., Chicago, Ill., has introduced a heavy duty disc sander to be known as the "Mallsander." This unit is streamlined, light in weight, and perfectly balanced for easy operation with right or left hand.

The standard equipment of the Mallsander includes 15 ft. of cord and plug, 7 in. backing pad and abrasive, and a



KING PLATING BARRELS

PRODUCE CLEANER, FASTER, SMOOTHER PLATING

A cylinder shape wood woven barrel that is made to fit into any barrel plating equipment.

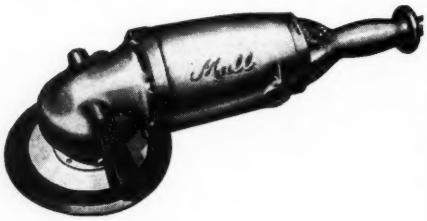
Write for illustrated folder.

Use them once—you'll use them always

JOHN KING
48 SPRINGFIELD ST., DAYTON, OHIO

special spindle lock that fastens the spindle when removing or applying the abrasive disc.

The Mallsander has a high torque, high powered, cool running motor, spiral



Mallsander

bevel chrome nickel alloy steel gears, and an extra strong light weight housing. The no load speed of the motor is 4,200 r.p.m.

All bearings are said to be dustproof. The handle on the unit is reversible and can be used for either left or right hand operation. A large air inlet arranged so that grit and dirt cannot be lodged around brush holders or shaken on commutator provides ventilation.

The Mallsander can be used for applications such as sanding, cleaning, or grinding. It is said to work effectively for removing arc weld marks and smoothing welds on metal cabinets.

Partlow Model 308 Time Delay Relay

A time delay rely designated as the "Model 308" for automatically timing the duration of a process cycle has been placed on the market by The Partlow Corporation, 2 Campion Rd., New Hartford, N. Y. This instrument comprises a synchronous timing motor driving a gear train through a magnetically engaged clutch. At the end of the timing period, a switch operates to stop the timing motor and either connects or disconnects the load as desired. Upon breaking the timer circuit, the magnetic clutch releases and the timer automatically resets itself.

The timing is easily adjusted by setting a knob and pointer to the desired time on a calibrated scale. As the timing period elapses, the pointer travels over the scale and indicates the amount of timing period remaining. The Model 308 Time Delay Relay is supplied entirely enclosed in an attractive black ripple finish aluminum case with a glass window or open-faced cover for observation of the dial. Four knockouts are provided for convenient wiring. Four

Partlow Model 308 Time Delay Relay

METALPREP
"Used First — Makes Your Paint Finish Last"

Metalprep has been used on more than ten million units for preparing all sheet metal surfaces before painting.

PROVIDES A FIRM, LASTING BOND BETWEEN METAL AND PAINT.

Write for Literature Today.

NEILSON CHEMICAL CO.
6564 BENSON ST. DETROIT, MICH.

For a real good polishing job use
KEYSTONE EMERY
TURKISH — NAXOS — AMERICAN
KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

timing ranges are available in all models: 0 to 5 min., 0 to 15 min., 0 to 50 min., or 0 to 5 hours.

Skin-A-Cat Respirator

A twin filter respirator to be known as the "Skin-A-Cat" Respirator No. 40 has been placed on the market by H. S. Cover, 110 Chippewa St., South Bend, Ind. This filter is said to have 40 square inches of filtration area and a unique construction that requires no filter retaining plates. Filters are held in place by adjustable tubular connections.

The filters are said to resemble miniature sofa cushions which stay flexed without the necessity of spacing devices or dividing segments. Filters of this design are said to eliminate any choke or collapse and to make possible a more free breathing condition.

Two check valves and an exhalation valve are provided so that moisture cannot collect. The face piece is of rubber and makes an air-tight fit on

Skin-A-Cat Respirator

any shaped face. A face cloth is said to provide protection against the possibility of dermatitis, and to provide comfort in wearing.

Fostoria Para-Sphere Reflector

Gold-plated reflectors for use with infra-red ray lamps, to be known as "Para-Sphere," have been placed on the market by The Fostoria Pressed Steel Corporation, Fostoria, Ohio.

According to the manufacturer, the Fostoria Para-Sphere will accommodate commercially available infra-red ray lamps by means of an easily adjustable porcelain socket. In this manner, any lamp of this type can be brought to the proper focus for the heating or drying of work at hand.

Para-Spheres are supplied in single re-

Fostoria Para-Sphere Reflector Model S-4

flector units and in strips of four, five, six, and seven reflectors, thus providing a size suitable for any type of installation. Strips are of the two-piece design so that wiring and mounting may be accomplished with a minimum of labor and expense.

SAVE METAL AND PAINT

DEOXIDINE prepares metal surfaces perfectly for painting.

ELECTRO, SPRAY and THERMOIL GRANODINES protect against rust and preserve paint.

LITHOFORM keeps paint intact and lustrous on zinc and cadmium surfaces.

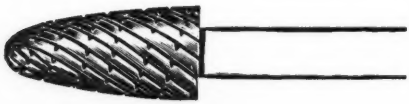
Write for bulletins

AMERICAN CHEMICAL PAINT CO.

BOX 303 • AMBLER, PENNA.

Grobet Rotary File

Rotary files which are ground from the solid have been placed on the market by Grobet File Corp. of America, 3 Park Place, New York, N. Y. This



Grobet Rotary File

type of file has been added to the regular line of hand cut rotary and milled cut rotary files and is made of super high speed steel.

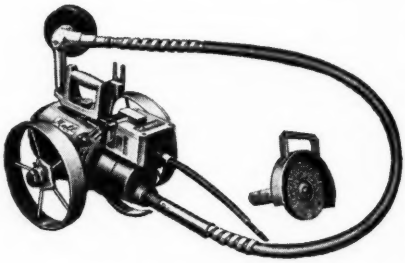
Grobet Rotary Hand Cut Files are ground from the solid after hardening. According to the manufacturer, one of the principal advantages of this type of file is that it can be resharpened many times.

Mall 3 H.P. Three-Phase Grinder

Illustrated is a Mall 2 h.p., three-phase, 60 cycle, geared head grinder with two-wheel mounting which has been placed on the market by Mall Tool Company, 7740 S. Chicago Ave., Chicago, Ill. The motor operates on 220 or 440 volt, 60 cycle, three-phase current. It can also be furnished for operation on 50 cycles and 25 cycles. The flexible shaft or grinding speed is 5,500 r.p.m.

The motor is totally enclosed and dust-proof. Although rated at 3 h.p., it is said to be capable of delivering 100 per cent additional power on momentary overloads. It has tremendous power, with plenty in reserve for every class of heavy grinding, polishing, and buffing.

The large mounting wheels, which can be furnished with either steel rims or pneumatic tires, permit the use of this



Mall 3 H.P., Three-Phase Grinder

equipment on irregular floors or dirt floors customarily found in foundries and in many industrial plants.

Jackson Model CH-5C Eye Shield

An eye protection device consisting of a light, adjustable, transparent shield that will not ignite spontaneously and which is said to offer effective protection from hot sparks, dust, and flying particles, has been placed on the market by Jackson Electrode Holder Co., Detroit, Mich. The visor is attached to a comfortable headgear, is amply ventilated, and will not fog.

The transparent visor, which is available in clear, smoked, amber, light green or dark green material, is bound with metal to ensure stiffness. A spark deflector guards the space between the

for
RADIANT ENERGY DRYING
NALCO DRITHERM
(INFRA-RED RAY)
CARBON LAMPS
Cut drying costs . . . Save time . . . Use minimum space . . . Get uniform results
Write for information and prices today.
NORTH AMERICAN ELEC. LAMP CO.
1020 TYLER STREET ST. LOUIS, MO.

Increase Production
Varied shapes and sizes more uniformly Finished
SEND SAMPLE TIME STUDY GLADLY GIVEN.
Packer-Matic Automatic
Polishing & Buffing Machines
Cut Hour Costs
Automatically — today's Method of Finishing
THE PACKER MACHINE CO.
MERIDEN, CONN.

visor and forehead without cutting off ventilation, and a fireproof duck skull cap extends halfway back over the

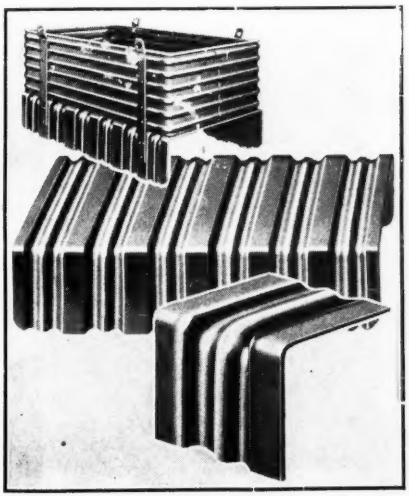
Jackson Model CH-5C Eye Shield

head, protecting the head and hair. The shield is designated as the Model CH-5C.

Union Metal Skid Platform

An all-steel lift truck platform with corrugations has been placed on the market by The Union Metal Manufacturing Co., Canton, Ohio. This type of platform is available in variations and includes a complete line of steel corrugated platform boxes.

The construction of the platform corrugation consists of two half-round recesses joined by a raised center rib. Both recesses and raised rib traverse the entire deck of the platform, rolling over the knee in a gradual curve and down the legs. It is stated by the manufacturer that this type of construction gives unusual strength and longer life.



Union Metal Skid Platform

U. S. Stoneware Bulletin No. 404. An eight-page bulletin designated as Bulletin No. 404 describing tanks, jars, pots, trays, and storage and mixing equipment for acid and corrosive chemicals is now being issued by The U. S. Stoneware Co., Akron, Ohio.

"U. S. Standard" chemical stoneware is said to be a clean, well-vitrified, and dense-bodied ceramic product made from a selected combination of scientifically prepared clays. These clays contain a minimum of iron, lime and other injurious ingredients. The construction of the equipment is one piece, without joints. and therefore is said to be permanently

Borolon
TRADE MARK

First quality aluminum oxide abrasive grain manufactured in our own electric furnace plant under strictest standards of quality and uniformity. Available in four types (CT, T, B, TB), each of which is most efficient for polishing work within its field of application. Write for Abrasive Grain Data Sheet No. 1 giving complete details. Samples sent of grain sizes you specify.

POLISHING GRAIN

ABRASIVE COMPANY
Division of Simonds Saw and Steel Company
Tacony & Fraley Streets · Philadelphia, Pa.
Chicago Branch: 1624 South Western Ave.

leak-proof and trouble-proof.

All surfaces of "U. S. Standard" chemical stoneware have a smooth salt-glaze finish. The color is a rich mahogany brown which retains its color even after years of severe service.

Bulletin No. 404 is one of the most complete bulletins of its kind ever to be offered to the plating and finishing field. A copy of this bulletin will be sent free upon request.

"Industrial Head and Eye Protection." This is the title of a 48-page book which lists a wide variety and complete line of goggles, respirators, spectacles, masks, and safety devices now being issued by Chicago Eye Shield Company, 2300 Warren Blvd., Chicago, Illinois.

In addition to regular product listings, there is included general information on how non-shattering glasses are made, what a worker should wear and why when exposed to ultra-violet and infra-red light rays, and what type of respirator is recommended for more than 325 harmful gases, fumes, mists, and dusts.

A copy of "Industrial Head and Eye Protection" will be sent free upon request.

Check in ✓ DeWITT OPERATED HOTELS

In CLEVELAND it's

√ The HOLLENDEN

In COLUMBUS it's

√ The NEIL HOUSE

In AKRON it's

√ The MAYFLOWER

In JAMESTOWN, N. Y., it's

√ The Jamestown and

√ The SAMUELS

THEO DEWITT, *Pres.* R. F. MARSH, *V.P.*

Despatch Indirect Air Heater Bulletin No. 74. Despatch Indirect Air Heaters for ovens, dryers, and space heaters are described in this bulletin which is now being issued by Despatch Oven Company, 622 S. E. Ninth St., Minneapolis, Minn. This bulletin tells how various industries equipped with indirect heating units have been able to save money by eliminating maintainence, and lowering fuel costs.

Bulletin No. 74 outlines briefly the history of indirect air heating and gives valuable information on the design and construction of the new Despatch Heavy Duty Indirect Air Heater. The bulletin is attractively arranged and there is an abundance of interesting illustrations.

A copy of Despatch Indirect Air Heater Bulletin No. 74 will be sent free upon request.

Davis Face-Shield Bulletin. A bulletin covering a new line of face-shields, which are recommended for protecting workers from dust, heat, and glare, has just been published by the Davis Emergency Equipment Company, 55 Van Dam St., New York, N. Y.

The line described in the bulletin consists of four different types of face-shields ranging from a light weight, visorless shield to a shield with a fiber visor that protects the front part of the head from lacerations and bumps. All types are provided with replaceable transparent Plastacele windows which resist heat, acid, and caustics. These windows are furnished in clear, green, or amber colors, depending upon the specifications required.

A copy of this bulletin will be sent free upon request.

Continental Semi-Automatic Polishing and Buffing Equipment. An interesting eight-page bulletin showing various types of round, out-of-round, flat, tapered, tubular and irregular contoured work being polished and buffed by semi-automatic polishing and buffing heads for use with double spindle lathes is now being issued by Continental Roll & Steel Foundry Company, Industrial Equipment Div., Railroad Ave., East Chicago, Indiana.

Also described is the Continental composition applicator for semi-automatic equipment and the Continental tube burring machines, tube bending machines, and tube mills which fabricate tubing from cold rolled strip.

Copy free upon request.

OPPORTUNITY SECTION

TWO SOUTHERN REPRESENTATIVES WANTED
Who are interested in adding to their present income by selling S-I-P lacquers, solvents and synthetic enamels to a few of their preferred accounts. Full protection on repeat business, etc.

Standard Industrial Products, Inc.
Evansville, Indiana
"Makers of Faster Finishing Products"

BARGAIN

IN PLATING GENERATORS

1250/625 amp. 6/12 volt H. & V. W.
750/375 amp. 6/12 volt H. & V. W.
400/200 amp. 6/12 volt H. & V. W.
300 amp. 3 volt Elec. Prod. vertical motor drive.
200 amp. 7½ volt Hobart, motor drive.
200 amp. 6 volt Electric Products, motor drive.
150 amp. 6 volt Connecticut.
150/75 amp. 7½-15 volt Eager, motor drive.
50 amp. 6 volt Leland, single phase motor drive.
Plating generators Bought, Sold, Exchanged. *Write*

THE MOTOR REPAIR & MFG. CO.
1535 Hamilton Ave. Cleveland, Ohio

WANTED—SALESMAN

To handle a complete line of INDUSTRIAL FINISHES in Chicago and surrounding territory. Give full information, including experience and past connections. All replies will be considered confidential. Address Box 5, PRODUCTS FINISHING, 431 Main Stret, Cincinnati, Ohio.

FOR SALE
Guaranteed DeVilbiss Reconditioned Guns
Booths—Fans—Transformers
DeVilbiss Distributors
Hovey Spray Equipment Co.
1509 Spring Garden St. Philadelphia, Pa.

PRICED LOW FOR QUICK SALE—

One used Gehnrich Gas Fired Drying Oven—6' 6" wide x 5' 6" deep x 6' 3" high, temperature regulator up to 500° F., complete with blowers but no motors.

Struthers-Wells Company
WARREN PENNSYLVANIA

SALESMEN WANTED

Salesmen selling to Industrial Trade as a side line Gold and Aluminum Bronze Powders and Pastes. Will furnish leads. Exclusive territory; commission basis.

EDWARD C. BALLOU CO.
6 Varick Street • New York

THIS Opportunity Section is available for classified advertisements featuring equipment, employment, business opportunities, etc., in the industries devoted to the cleaning, plating, polishing and finishing of metals. For advertising rates and other information address:

PRODUCTS FINISHING
431 Main Street • Cincinnati, Ohio

FOR YOUR *Catalog* LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Everything for the Pickling Room
A 4-page folder illustrating and describing equipment for practically every type of pickling operation is now being issued by Klaas Machine & Manufacturing Company, 4314 East 49th St., Cleveland, Ohio.

2. Unichrome Rack Coating-W
Folder describing a rack coating material for coating plating racks of all descriptions which will not be affected by boiling cleaners and plating solutions is now being issued by United Chromium Incorporated, 51 East 42nd St., New York, N. Y.

3. Micro Supreme Stop-Off Lacquers
A 4-page folder describing stop-off lacquers for insulating plating racks used in decorative plating and for masking parts to be hard chromium plated now being used by Michigan Chrome Company, 6342 E. Jefferson Ave., Detroit, Michigan.

4. Phill-Co Degreasers
Portable electrically operated degreasing units are described in this catalog which is now being issued by Phillips Manufacturing Company, 340 W. Huron St., Chicago, Illinois.

5. Modern Electroplating Control
Modern electroplating control with Sangamo Amperehour Meters is discussed in an 8-page catalog now being issued by Lasalco, Inc., 2822-38 LaSalle St., St. Louis, Missouri.

6. Paint Adhesion for Zinc or Cadmium Surfaces
A method for obtaining paint adhesion for galvanized iron and other zinc or cadmium surfaces by means of Lithoforming is described in the catalog which is now being issued by American Chemical Paint Company, Box 303, Ambler, Pennsylvania.

7. Air Filters for Spray Booths
Bulletin No. 244 now being issued by American Air Filter Company, Inc., 133 Central Ave., Louisville, Ky., describes special filters for spray booths that are said to remove spray vapor from exhaust air before it reaches the fan and ducts.

8. Hovey Spray Equipment
A 4-page catalog describing and illustrating Hovey Spray painting guns and painting outfits is now being issued by Hovey Spray Equipment Co., 1509 Spring Garden St., Philadelphia, Pa.

9. Woven Wood Plating Barrel
Folder describing many features of the King woven wood plating barrel. John King, 48 Springfield St., Dayton, Ohio.

10. Ross Metal Decorating Oven
A complete description of the equipment for baking decorative coatings on metal is now being issued by J. O. Ross Engineering Corporation, 350 Madison Ave., New York City.

11. "Blacking" Rust Preventative
A 10-page catalog describing the Du-Lite Process, a method whereby steel parts can be colored with a permanent black finish. Du-Lite Chemical Co., Highland Ave., Middletown, Connecticut.

12. Cadmium Plating
A catalog describing the Cadalyte Bright Dip Process of cadmium plating is now being issued by E. I. du Pont de Nemours & Company, Wilmington, Del.

13. Economical Degreasing
A series of leaflets covering practically every phase of metal degreasing are now being published by Detroit Rex Products Co., 13017 Hillview Ave., Detroit, Michigan.

14. Airway Ventilated Buffs
Cool cutting buffs for high speed buffing operations are illustrated and described in a 4-page folder now being distributed by Jackson Buff Corporation, 21-03 41st Ave., Long Island City, New York.

15. Gas or Oil Fired Indirect Air Heater
An interesting illustrated bulletin describing the many new features of the new Despatch Indirect Air Heater. Despatch Oven Co., 622 S. E. Ninth St., Minneapolis, Minnesota.

16. Dust Collecting Systems
An attractive 24-page catalog has just been issued by The Kirk & Blum Mfg. Co., 2816 Spring Grove Ave., Cincinnati, Ohio, which illustrates and describes many K. & B. Dust Collecting Applications installed in numerous industries.

17. Centrifugal Dryer for Plated Work
A folder describing the Krieder Centrifugal Dryer for drying all types of plated work and lacquering small parts. Dellinger Manufacturing Company, 729 N. Prince St., Lancaster, Pennsylvania.

18. Bonderizing
The Parker Process that holds paint to steel and resists rust, known as "Bonder[illegible]" described in this catalog now being issued by Parker Rust Proof Company 2172 E. Milwaukee Ave., Detroit, Michigan.

19. Spray Paint and Finishing Equipment
A most complete catalog describing and illustrating spray painting and finishing equipment manufactured by Binks Manufacturing Company, 3114 - 40 Carroll Ave., Chicago, Illinois.

20. New Wrinkle Dipspray
A castings finishing process known as "Dipspray" is described and illustrated in this catalog which is new being issued by New Wrinkle, Inc., Mutual Home Bldg., Dayton, Ohio.

21. "Tygon" for Process Equipment Linings
A 4-page folder describing "Tygon" as a lining material for process equipment. The U. S. Stoneware Co., Akron, Ohio.

22. Custom-Built Finishing Equipment
A 24-page catalog presenting various problems encountered in the cleaning of metals parts and describing the methods and machines used in the solution of these problems. N. Ransohoff, Inc., 212 W. 71st St., Cincinnati, Ohio.

Print plainly in filling out coupon for literature.

PRODUCTS FINISHING
431 Main St., Cincinnati, Ohio

I am interested in receiving the following literature reviewed in your December issue.

No...... **No.**..... **No.**..... **No.**..... **No.**.....
(Insert numbers denoting literature you want.)

Name ..... Title.....

Company .....

Company Address .....

City ..... State.....

Index TO ADVERTISEMENTS

Abrasive Company 75
Abrasive Products, Inc. 4
American Air Filter Co., Inc. 5
American Chemical Paint Comapny 73
American Instrument Company 53
Ballou Company, Edward C. 77
Barton Mines Corporation 58
Burns Mfg. Corp., E. Reed 69
Detroit Rex Products Co. 25
DeWitt Hotels, Inc. 76
Egyptian Lacquer Mfg. Co. 6
Hamilton Emery & Corundum Co., The 62
Heatbath Corp. 2
Hilo Varnish Corporation 15
Hovey Spray Equipment Co. 77
Jackson Buff Corporation 40-41
Juergens Co., Wm. A. 69
Keystone Emery Mills 72
King, John 71
Kirk & Blum Mfg. Co., The 23
Lasalco, Inc. 19
Lupomatic Tumbling Machine Co. 70
Mahon Company, The R. C. 21
Mechanical Process Corporation 64
Michigan Chrome Company 8
Midwest Buff Manufacturing Co. 70
Miller Rubber Company 57
Motor Repair & Mfg. Co., The 77
Neilson Chemical Co. 72
New Wrinkle, Inc. ..... Fourth Cover
North American Electric Lamp Co. 74
Norton Company 31
Oakite Products, Inc. 1
Oriental Rouge Co., Inc. 68
Packer Machine Co., The 74
Parker Rust-Proof Company 35
Pennsylvania Salt Manufacturing Company 12-13
Pulmosan Safety Equipment Corp. 67
Ross Engineering Corp., J. O. ..... Third Cover
Roberts Rouge Co. 66
Roxalin Flexible Lacquer Co., Inc. ..... Second Cover
Rusticide Products Co. 68
Sievering, Inc., Philip 61
Skilsaw, Inc. 59
Standard Industrial Products, Inc. 77
Stanley Chemical Co., The 3
Struthers-Wells Co. 77
United Chromium Incorporated 65
Varnish Products Co., The 60
Walker Co., H. V. 39
Watson-Standard Co., The 37
Woolford Wood Tank Co. 47

PRODUCTS FINISHING

PUBLISHED BY GARDNER PUBLICATIONS, INC.

431 MAIN STREET • CINCINNATI • OHIO